THE IRON AGE

New York, October 26, 1922

ESTABLISHED 1855 VOL. 110, No. 17

From Ore to Nails in Minnesota Plant

Steel Corporation Adds Rod Mill and Wire Plant to Its Duluth Works—Labor-Saving Devices and Safety Measures Are Features

BY GILBERT L. LACHER*

THERE are few American steel works where the making of pig iron from the ore, steel from the iron and finished wire products from the steel are all concentrated under a single management. With the completion of a wire mill in July and a wire rod mill in September, the Minnesota Steel Co., Duluth, Minn., entered that class of plants. The products of the wire mill are sold by the American Steel & Wire Co. and are branded with its trademarks and stencils, but the operation of the mill is entirely under the management of the Minnesota Steel Co. The new plant is a "common products" mill, making nails, fence, barbed wire and galvanized wire exclusively as contrasted with "market wire" mills which make springs, wire hoops, wire rope and strand, insulated wire and cable and various other specialties used largely by manufacturers.

A glance at a map of the United States discloses why Duluth is a logical location for a common products plant. Extending northwest, west and southwest is a great expanse of territory in which agriculture is the principal occupation. Manufacturing centers using special wire goods lie mainly to the south and east of this region and are properly customers of mills making those products. The zone tributary to Duluth is more clearly defined in freight tariffs which give the Minnesota Steel Co. mill an advantage over Chicago district works in the northern peninsula of Michigan, the northwestern half of Wisconsin, in Minnesota, the Dakotas and the territory west and north of those states. The excellent location of the new mill is further emphasized by the fact that Duluth has long been a distributing point for common products.

The new plant which makes Duluth a producing, as well as a distributing, center combines in its construction and equipment the most advanced ideas developed in the various works of the American Steel & Wire Co. The rod mill, which connects with the billet mill of the previously constructed works of the Minnesota Steel Co., is 80 x 400 ft., with a capacity estimated at 400 tons per 24 hr. The wire mill is a separate unit detached from the remainder of the plant, and measures 320 x 1500 ft., covering nearly eight acres. Its production under normal conditions will be 300 tons per 24 hr. and is expected to reach upward of 2400 tons of finished

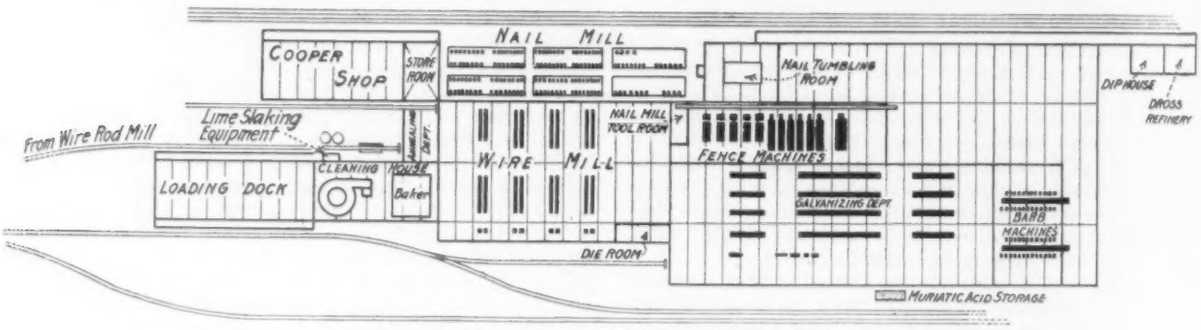
*THE IRON AGE, Chicago.

Wire Drawers Are Relieved of Lifting by an Electric Hoist Operating on a Monorail Crane

products per week. The entire output will be in low carbon basic steel. Like all other structures of the Minnesota Steel Co., the new buildings are of unusually substantial construction to withstand the rigors of the severe climate. The structural work is of steel, the roof of 3-in. fir with Johns-Manville asbestos roofing, and the walls of cement blocks which were made on the grounds. The blocks are hollow, providing columns of air which serve to keep the dampness and cold out of the buildings.

A striking feature of the wire mill is the attention which has been given to labor-saving and safety devices. Particular heed was given to relieve the wire drawers from heavy lifting.

The drawing room has 168 22-in. blocks and 36 16-in. blocks, arranged in four double rows and driven by eight motors. The motors are placed in pairs and spaced 7 ft. center to center. Three of the double rows comprise 48 22-in. blocks each, or 24 on a side. Each row of 24 blocks is driven by a 225-hp. Allis-Chalmers motor. There are also two rows consisting of 18 16-in. blocks and 12 22-in. blocks each, the 16-in. and 22-in. blocks being bench to bench. These blocks are driven by two 150-hp. Allis-Chalmers motors, as less power is required to run a line of 18 16-in. and 12 22-in. blocks than a solid line of 24 22-in. blocks. Each motor is connected with its line shaft by a flexible coupling and the shaft drives the blocks through bevel gears. A central aisle divides the rows of blocks in half, benches of 12 blocks each being on each side, except in the case of the 16-in. blocks which consist of two benches of 18 blocks



Wire and Nail Plant of the Minnesota Steel Co.

back to back. The drawing room contains space for two additional rows of blocks.

The number of blocks operated by a single workman comprises a frame. Usually the number of blocks in the frame is identical with the number of drafts which must be made to produce the wire of the desired gage. Ordinarily the number of drafts is four.

Unusual precautions have been taken to protect the wire drawers from accident. Four means have been provided to stop the rotation of a block. One is the foot pedal ordinarily used by the operator to engage and disengage the clutch driving the block. A hand lever in back of the operator when he is facing the bench may be used to stop the block in case of a snarl which might make it difficult for him to reach the pedal. A third means is a lever located next to the block in a position where it is likely to be struck by the body of the operator in case he is caught by the wire as it is being drawn on to the block. This lever releases a weight which, in dropping, instantly throws the block out of engagement with the clutch. While this weight is down the block cannot be started again by either pedal or hand lever. It is first necessary to pull up a wire rope which draws the weight back to normal position. The fourth method of stopping a block in an emergency is by pushing a button which actuates a circuit breaker on the switchboard, thereby stopping the motor and all the blocks its drives. It will be noted that the stopping of a motor does not shut down all blocks in the drawing room as would be the case in some wire mills, but only two benches of 24 or at the most 30 blocks. Operation can also be resumed by push button.

For each frame of blocks there is a motor-driven roll pointer run by an eccentric on a motor driven shaft below the floor. A shear operated by the same eccentric is used to cut off the end of the rod which cannot be drawn because it has fins. The drawplates used are exceptionally hard high carbon iron castings. Powdered soap is used in the drawplate for the first draft but subsequent drafts are made without additional lubrication.

When finished coils of wire have been drawn, they are lowered on to trucks by the monorail hoist and are then moved by Elwell-Parker storage battery tractor to a Fairbanks registering beam scale. On the bottom of the beam of the scale is type comprising numbers corresponding to the graduations on the beam. When the beam balances, the operator inserts a card, throws a hand press against the type, thereby perforating the card with the weight of the truck load on the scale. The tare weight of the truck is taken at frequent intervals. The cards are filed away with the invoices against shipments to the trade and serve as reliable evidence of the correctness of the weight entered on the invoice. A weighing clerk might easily transpose numbers in writing them down, but there is no chance of this when using the registering beam.

While some wire goes directly to the trade, a considerable portion goes to other departments for further operations, including galvanizing and the making of nails, staples, barbed wire and fencing.

The wire rods from which the wire is drawn are shipped by flat car from the rod mill. The bundles are loaded on trucks so that it is an easy matter to push the trucks from the cars to the loading dock of the wire mill. Each truck has a capacity for 10 bundles, or an aggregate weight of approximately 3000 lb. The truck was designed and constructed by the Minnesota Steel Co. and is well adapted for handling by storage battery tractor. It is supported by two large wheels in the middle and one small wheel at each end. As a result the truck tips toward the tractor when drawn and away from it when pushed, at no time resting on more than three wheels. Steering is therefore rendered easy whether the truck is pushed or pulled.

The Elwell-Parker tractor is connected with the truck by a triangular coupling devised by the company's own engineers. This coupling has three hooks, one of which is passed through an eye either at the front or back of the tractor, and the other two through eyes on the end of the truck. The tractor, which is an Elwell-Parker type T.C., has a two-wheel drive and a four-wheel steer so that it can make a very sharp turn. The tractor has a number of striking safety features. Operation cannot start until the driver is sitting on the seat. Furthermore, the operating lever must be brought to vertical position before the tractor can be started forward or backward. The importance of this precautionary measure is realized when one considers that the lever might be carelessly or accidentally pushed forward or backward while the tractor is standing still. While it is essential that the driver take his seat before the tractor will start, the mere fact that the lever is in an operating position will not result in a sudden lurch forward or backward. For the charging of the tractor batteries for General Electric motor generator sets driven by 7½-hp. a.c. induction motors have been provided. Each set is served by a control board which prevents the ruining of batteries through overcharging. There are two scales on a board, one graduated up to

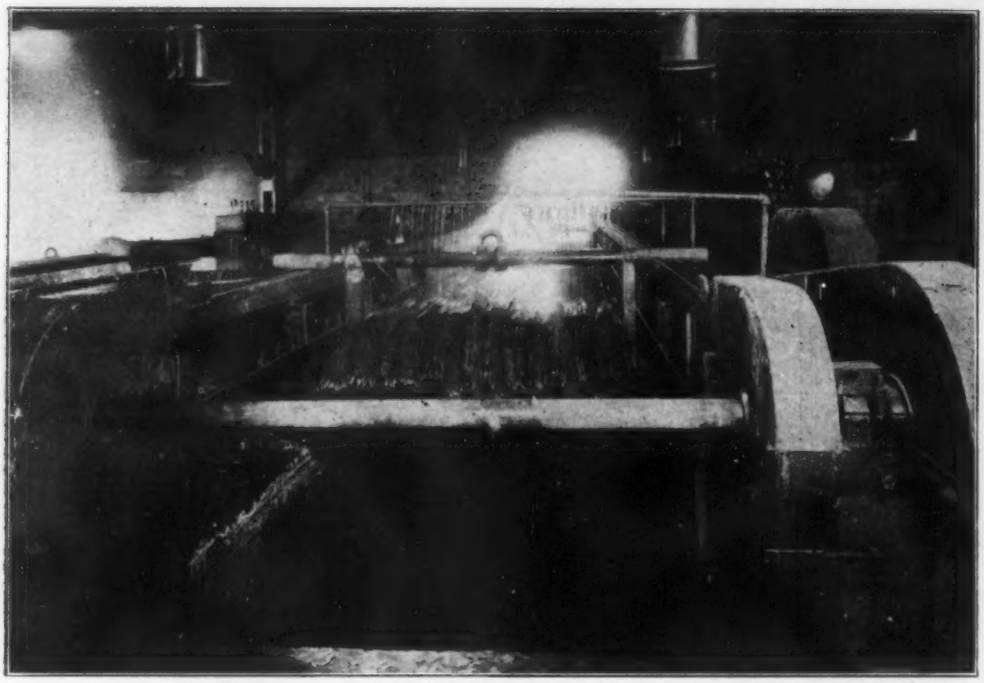
In the Cleaning House Five Acid Tanks and One Water Tank Are Arranged in a Semicircle Around a Jib Crane, Which Is Raised and Lowered by Steam and Turned by Motor, Having a Range of the Full 360 Deg. In the foreground are a number of the yokes used to hold the bundles when suspended over the vats

100 amperes and the other up to 75 volts. These are set and when the charging is completed the current is automatically disconnected. Exide storage batteries are used in the tractors.

From the loading dock trucks of rods are passed through a scale house where they are weighed and then brought into the cleaning house. Here five acid tanks and one water tank are arranged in a semi-circle around a jib crane. The crane is raised and lowered by steam and is turned by motor, having a range of the full 360 deg. A yoke suspended from the crane is passed through the rod bundles, whereupon they are hoisted, swung to position over an acid tank and then lowered into the solution. Each end of the top of the yoke rests on the edges of the vat, supporting the rods during the removal of scale. Two yokes of rods may be placed in a tank at one time so that 10 yokes, supporting 30,000 lb. of rods, may be lying in the acid solution simultaneously, there being five tanks.

The agent used to remove the scale is a weak solution of sulphuric acid, the supply of the acid being drawn from two storage tanks just outside of the house, each of which has a capacity of 1,106,000 lb. Before reaching the vats the acid passes from the storage tanks to a measuring tank inside the house which contains approximately a day's supply. The amount of acid introduced into the vats is gaged by five measuring boxes, one for each vat, located at the axis of the jib crane. The amount to be added to each solution is a matter of judgment, depending on the amount of scale on the rods. A sure test of the effectiveness of the solution lies in an inspection of the rods after they are withdrawn from it. If any scale can still be seen the solution is too weak and the rods must be reinserted in the vat. The acid vats are heated by steam which passes into the solution through perforated pipes. Successive additions of acid are made to the solution until the Baumé scale gets too high because of the scale de-

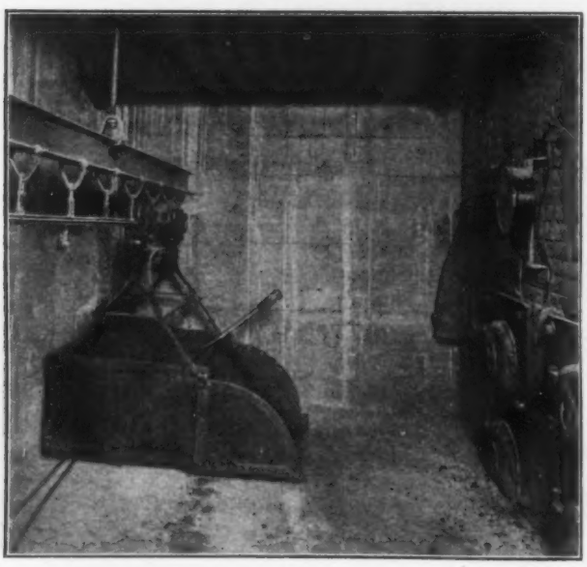
Wire Rods Are Shipped by Flat Car in Truck Loads from the Rod Mill to the Loading Dock of the Wire Plant. Here it is an easy matter to roll the trucks from the cars to the dock. The trucks are hauled throughout the wire plant by tractors. A triangular coupling between the tractor and truck facilitates steering



A Slowing Moving Double Continuous Chain Belt Carries the Yokes Through a Sull Tank, Where the Rods Are Subjected to a Number of Sprays and Mists Which Give the Steel a Thin Uniform Coating of Rust Termed Sull

posited, whereupon the vats are emptied and refilled. To draw off the acid fumes rising from the vats large wooden canopy has been suspended from the ceiling of the house.

After the removal of scale in the acid vats the yokes of rods are placed in a hot water tank where the acid is washed off. The crane then transfers the yokes to a double continuous chain belt, each end of the yoke resting on a belt while the rods are suspended over a long sull tank. The belts are operated by motor and are geared low so that the yokes pass over the tank very slowly. The rods first pass through a vigorous down-spray which gives them a thorough drenching and then through four gentle sprays, termed "mists." Two of the mists strike the rods from above and two from the side, the latter being so situated to reach the inside of the bundles. By the time a yoke has reached the end of the tanks the bundles are covered with a thin uniform coating of brown rust called "sull" which serves as a lubricant when the rods are drawn into wire. At this point a 2-ton Alliance overhead electric traveling crane hoists the yoke and lowers it to a vat, where the rods are immersed in lime for the purpose of neutralizing any remaining acid on the steel and to prevent corrosion. The lime also serves as a lubricant in the subsequent drawing of the wire.



Coal Is Brought by Monorail to the Doors of the Furnaces Which Heat the Bakers. The shoveling of the coal into the furnace door requires but a short pass by the fireman

From the lime tank the yoke is transferred to a waiting coil truck standing on depressed concrete tracks leading into a 10-track continuous baking oven with a capacity of 70 trucks. The trucks are pushed into the ovens by double motor-driven chains, dogs from the chains engaging the axles. If an oven track is full, a truckload is automatically pushed out of the discharge end when a fresh truckload is pushed in. The doors at both ends are hung on a slant so that they close by gravity, the entrance doors swinging inward and the discharge doors outward. When the trucks are discharged from the oven they pass by gravity down an incline to the floor of the drawing room.

The bakers are heated to about 300 deg. Fahr., their sole purpose being to dry the rods thoroughly. Heat is supplied by coal-fired furnaces located in the basement. While the furnaces are hand-stoked, the coal never touches the floor because of the ingenious conveying system employed. Coal from both drop-bottom and side-dump coal cars is discharged through a grid into a concrete bin under a railroad siding next to the building. From this storage, coal is transferred to a coal carrier with a capacity of 1000 lb. The carrier is suspended from a monorail system, installed by the Lowden Machinery Co., Fairfield, Iowa, and is easily pushed by hand to a position directly in front of the furnace door to be fed. Here the side of the carrier nearest the furnace is lowered so that the shoveling of the coal from carrier to door requires but a single short pass by the fireman. The carrier was designed by the Minnesota Steel Co.'s own engineers. A carrier furnished by the Lowden company is used for removing ashes, the carrier being passed by monorail from the furnaces to a position under the railroad siding where it is picked up by a continuous bucket elevator, emptied into a waiting railroad car and returned to the monorail.

The furnaces are divided into five units or "houses," one house heating two tracks of the baker above. This arrangement of the furnace and baker into separate units enables the management to operate only part of the oven, if it so desires. Each house is served by a recording Bristol thermometer which registers on a chart the temperature at all times during the course of 24 hr. A blank chart, of course, must be inserted in the thermometer every day.

In a section of the plant next to the baking ovens is a muffled annealing furnace which is used for annealing wire for special purposes, such as wire for the making of staples. Wire must likewise be annealed for fabrication into woven fence and barbed wire. This annealing, as well as the galvanizing of the wire to protect it from rust, is done in another section of the plant connecting with the end of the drawing room opposite that adjacent to the bakers. In this room there

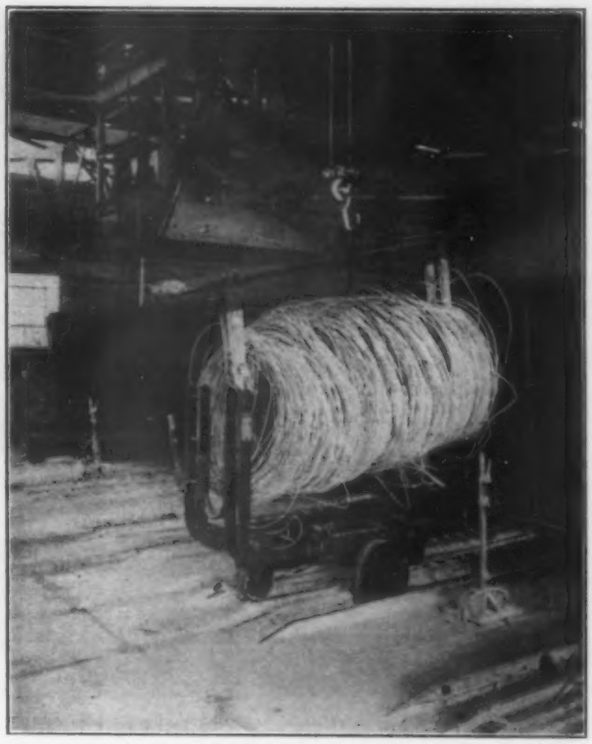
are four separate continuous annealing and galvanizing units arranged parallel to each other. The treatment of the wire consists of passing parallel strands through a lead bath for annealing, then through a tank of muriatic acid to remove the scale, from there through a hot water bath to wash off the acid and through a flux consisting of a neutral solution of hydrochloric acid to insure further the removal of all traces of the acid. From the flux it passes over a hot plate to be thoroughly dried and then into a zinc bath. After it emerges from the spelter tank the wire is wound on take-up frames from which it is removed in bundles by overhead hoist.

The operation of each annealing and galvanizing unit is continuous. The motor-driven take-up frames pull the wire through all steps of the process. The bundles of wire treated in the process are brought from the drawing room into the galvanizing department on trucks from which they are transferred to double reels by Reading overhead electric hoists operating on a monorail built by the Cleveland Electric Tramrail Co. It is to be noted that the bundle-handling equipment is the same as in the drawing room except that in this case a monorail crane is not required. The double reel is a very useful aid to the continuous operation of the galvanizing unit, because it holds two bundles, one above the other. As soon as the bottom bundle has been unreeled, the end of it is spliced on to the top bundle which is then dropped to the bottom of the reel. Another bundle is then placed on the top of the reel so that it will be in readiness for a repetition of the operation just described.

The splicing of wires calls for vigilance on the part of the attending employees. After the wire passes through the spelter bath it is necessary that it be wiped to insure a smooth uniform coating. For this purpose asbestos wipers have been provided. A splice, however, will not pass through a wiper and it is therefore necessary to keep close track of the approach of the splices. Accordingly, at the entering end of the zinc bath trips have been placed which are thrown up by contact with the splices, thereby serving as signals to the operative stationed at the wipers. At such an indication he pulls up the wiper to permit the splice to pass through, at the same time taking the opportunity to insert a new one, as the usefulness of a wiper does not extend beyond a single bundle of wire.

As previously noted, the lead bath is used for annealing. Lead is used as a heating agent because of its adaptability to close control. The bath is held at about 1375 deg. Fahr., the ordinary annealing temperature. A Leeds & Northrup recording pyrometer indicates the temperature of the bath at all times.

The muriatic acid bath is contained in a concrete tank. As concrete is not impervious to acid, the tank has a lining of vitrified brick which was laid in molten sulphur. The acid vats are entirely inclosed in wooden housings surmounted by hoods through which the fumes are drawn off to the roof of the building.

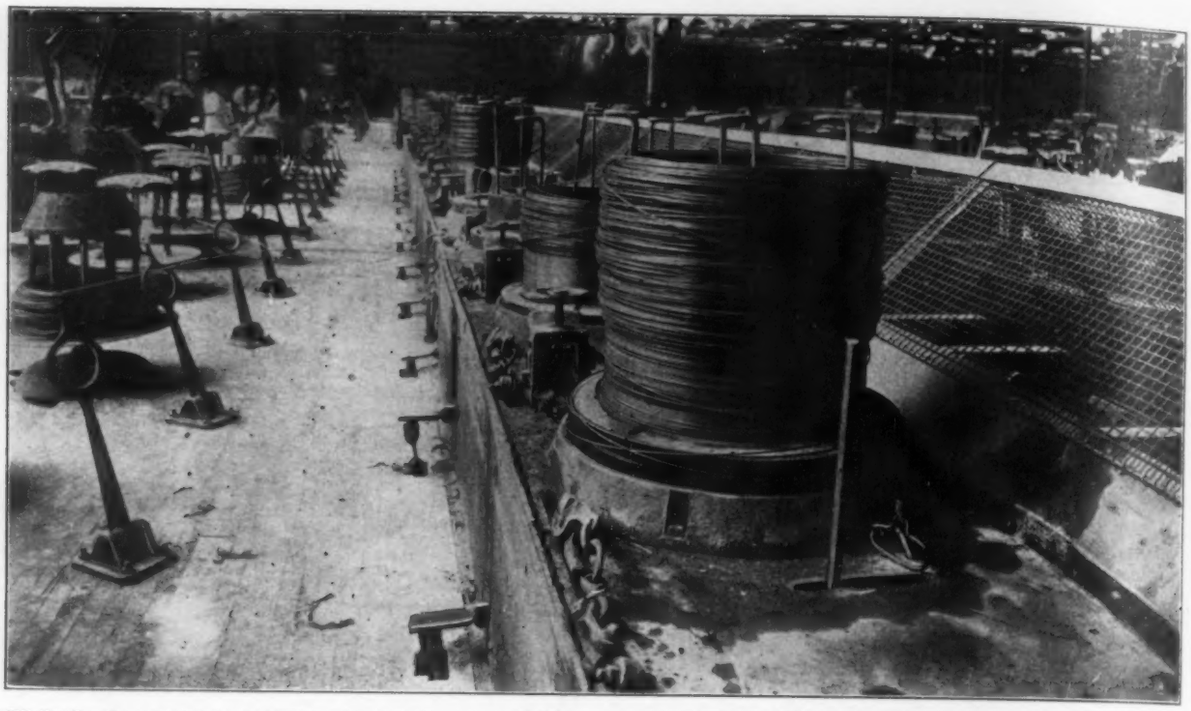


From the Lime Vat the Yokes Are Transferred by Overhead Crane to Trucks, Which Are Delivered by Chain Belt into the Baking Ovens

The temperature of the zinc bath is also controlled by a Leeds & Northrup pyrometer. As the purpose of this bath is merely to galvanize the wire, only sufficient heat is required to keep the spelter molten. The gases rising from the zinc bath are used to heat the hot plate over which the wire passes before entering the spelter. The purpose of the plate is to dry the wire thoroughly before it is immersed in the metal, thereby preventing sputtering and imperfect galvanizing.

As different annealing points are required for different kinds of wire, there is considerable variation in the time required to pass wire through an annealing and galvanizing unit. For the horizontal or line wires of a woven wire fence strength is required, while for the

As Different Annealing Points Are Required for Various Kinds of Wire, the Speed of the Take-Up Frames at the End of Each Galvanizing Unit Is Adjusted by Means of a Variable Speed Motor. The safety lever to be noted above each frame is so situated that it will be struck by the body of the operator should he be accidentally caught by the wire. As the bundles are removed from the frames they are loaded on waiting trucks by an overhead electric hoist operating on a monorail



While the Foot Pedal Is Ordinarily Used to Engage and Disengage the Block, the Hand Lever at the Left Is Employed When There Is a Snarl and It Is Difficult to Reach the Pedal. The lever in upright position next to the block is located where it is likely to be struck by the body of the operator if he be caught by the wire. The block then cannot be started again until a weight is pulled back into position by means of a wire rope the handle of which is shown just to the right of the emergency lever

vertical wires or pickets pliability is necessary. It is obvious that different heat treatment is called for by these two classes of wire. This illustrates the reason why provision had to be made for varying the speed of the take-up blocks which pull the wire through the baths. All of the take-up frames of each galvanizing unit are operated from the same shaft by a variable speed d.c. 25-hp. Westinghouse motor. Each frame is thrown in or out of engagement with the line shaft by a hand clutch. As a precautionary measure a safety lever has been provided for each frame. This lever works in the same direction as the rotation of the frame and is so situated that it will be struck by the body of the operator should he be accidentally caught by the wire. The operation of this lever instantly stops the rotation of the frame.

Each row of frames is served by a monorail and a 500-lb. electric hoist which enables one man to transfer the galvanized wire from the frames to trucks. From here the wire goes to the barbed wire department, the woven wire fence department or to the trade. The barbed wire department is equipped with 50 Universal barbed wire machines, running at the rate of from 250 to 350 barbs per minute, depending on the classes of wire being made. There are forty-six different types of barbed wire and it is the intention of the plant to make all of them. A noteworthy departure from standard practice in this department is the fact that all barbed wire is wound on metal spools made from galvanized wire. These are much superior to wooden spools which often break and cause a tangled jumble. The barbed wire machines are arranged in two groups, each of which is divided by an aisle containing a chain conveyor which carries the completed bundles into the warehouse.

The woven wire fence department contains seven National machines and five American machines, making two brands of fence. The American is a hinge-joint fence in which each stay connecting the longitudinal strands is a separate piece of wire. The national fence is of the continuous picket type, the picket or vertical wire being of one piece. Both types are furnished in 10, 20, 30 and 40 rod rolls and are made in 26, 32, 39, 47 and 55-in. heights. Likewise they are made in different specifications: with No. 9 gage top and bottom and No. 11 gage intermediate wire, with No. 10 top and bottom and No. 12½ intermediate, and with No. 11 top and bottom and No. 14 intermediate. Through the use of different heights and different gages of wire approximately 240 different styles of fence are made. A moving sidewalk conveys the rolls from the machines to the warehouse where, after weighing, they are either stored or loaded directly into box cars.

The nail department is equipped with 145 American crank machines, making from two-penny up to 60-penny nails inclusive, the last size being really a 6-in. spike. From 30 to 40 per cent faster than any other machine, the American machines produce from 150 to 660 nails per minute. This increased speed was made possible by a more sturdy construction, which is able to stand the vibration of more rapid operation. One striking feature of the construction is the base, which is a steel casting, in contrast with the usual base, which is cast iron. There are also two staple machines which make all kinds of fence staples. Both the nail and staple machines were designed and built in United States Steel Corporation shops.

The nail cleaning room is a department of unusual interest. This consists of a main floor and a balcony. As the nails come from the nail machines they are taken by elevator to the balcony where they are deposited in motor-driven tumblers. There are eight 50-keg and five 10-keg tumblers, the latter being used either for small nails or to handle small orders. Approximately two bushels of sawdust are used in each 50-keg tumbler and a proportionate amount in the smaller tumblers. The sawdust is drawn from a large storage bin which is filled from railroad cars below by means of a suction fan.

The nails are oscillated in the tumbling barrel from an hour to an hour and a half, following which the dust and whiskers are drawn off and the nails are discharged into a hopper below. When the hatch at the bottom of the hopper is opened the nails pour out on an incline from which they are raked into kegs. The kegs are fastened in oscillating arms which shake the nails down and cause them to lie flat. To prevent the nails from dropping to the floor, funnels with square shaped tops fitting close to each other and amply large to command the discharge vent in the nail incline at all times during the oscillation, are inserted in the heads of the kegs. The use of shakers has two important advantages, first, it packs the nails flat, thereby conserving the time of the carpenter when drawing nails from the keg and freeing him from the annoyance of pricking points; second, it makes it possible to use a smaller keg, thereby saving freight. The nails are packed in 100-lb. kegs.

which are probably the smallest kegs containing that weight used by any nail manufacturer. The diameter ranges from 9¼ to 11½ in., while the height in all instances is 17 in. All kegs are made in the company's cooper shop which has a capacity of 5000 kegs a day, the kegs being handled from the shop to the nail cleaning room by conveyor. A conveyor also moves the kegs from the shakers to a press where the top hoop is pressed on the keg, to a nailing machine which nails the hoop to the keg, and thence to the warehouse. A covered loading platform extends the whole length of one side of the warehouse. From this platform the kegs are rolled directly into box cars. From 600 to 1000 kegs are loaded into a single car.

Except for the warehouse and the cooper shop, which have flat roofs, the entire wire plant has sawtooth roof construction, thereby insuring the best of light for manufacturing operations. The warehouse, the nail cleaning room and the cooper shop are equipped with automatic sprinklers furnished by the General Fire Extinguisher Co. The "dry system" is used because of the danger of exposed water pipes being frozen by a sudden drop in temperature. Indication posts for the system are on a fire loop on the outside of the building. All fire apparatus is likewise outside, there being a fire hose over each hydrant with hose connected and in a rack for immediate use. The building is heated by hot air. Steam heating coils are suspended from the roof girders and air is blown through them and thence downward through discharge pipes into the room. The steam is supplied from the boiler house of the main works. During warm weather when the steam is disconnected, the system may be used to set up a circulation of air and thereby give the workmen relief from the heat. Each department is supplied with modern wash and toilet rooms which also contain individual lockers for all of the operatives.

Owing to the fact that the building rests on filled-in land, the floors of most departments are of temporary planking to allow the fill to settle. All machinery, of course, is on permanent foundations, which, however, are independent of the columns of the structure.

The rod supply for the wire plant comes from a two-line continuous type mill, having six 12-in. roughing stands and ten 10-in. finishing stands. A Morgan flying shear trims the billets as they pass from the roughing

Overhead Electric Hoists Operating on Monorails Are Used to Handle the 300-Lb. Bundles in the Annealing and Galvanizing Department. The double reels from which the wire is drawn through the annealing and galvanizing unit facilitate continuous operation. As soon as a bottom bundle has been unreeled, the end of it is spliced onto the top bundle, which is then dropped to the bottom of the reel

From a Hopper Located Under Each Tumbling Barrel, Nails Are Discharged onto an Incline from Which They Are Raked into Kegs. The kegs are fastened in oscillating arms, which shake the nails down and cause them to lie flat, thereby enabling the company to use smaller kegs. The square-top funnels in the top of the kegs prevent many nails from dropping to the floor as they are raked into the kegs

stands to the finishing stands. The mill rolls 1¾-in. billets down to No. 5 gage rods. The billets are approximately 30 ft. in length and the No. 5 gage bundles contain about 420 ft. of rod, weighing approximately 300 lb. The stands are driven by gear reduction from a 3000-hp. Allis-Chalmers a.c. motor. By rope drive the same motor operates the reels when No. 5 gage rod is being rolled. Coarser rods up to ½ in. in diameter will also be rolled and for this purpose a 100-hp. d.c. variable speed Westinghouse motor has been provided for the operation of the reels. This motor is equipped with an automatic speed controller and an electrical vibrating regulator connected with the main mill motor. This equipment regulates the speed variation of the 100-hp. motor to conform with that of the 300-hp. motor. This mill is the first to be equipped with an auxiliary motor of this kind and it is expected to accelerate the operations of the mill materially when it is changing from No. 5 gage to coarser rods.

The rods are transferred mechanically from the reels to a slide conveyor. The latter consists of a continuous chain belt with hooks on it operating through the middle of a flat incline, the hooks being inserted in the bundles and dragging them to the end of the incline where they are dropped into rod trucks stationed below. The trucks are placed on a transfer which permits an empty truck to be shifted quickly under the conveyor as soon as the previous truck has been loaded. The loaded trucks are wheeled directly on to flat cars which are then switched to the loading dock of the wire plant.

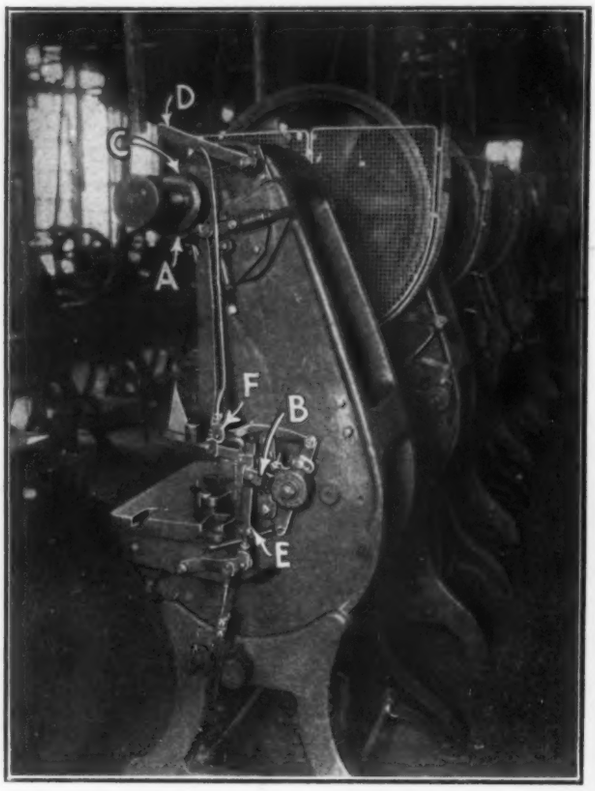
The rod mill is fed by a continuous reheating furnace with a capacity of 194 billets. The furnace is fired by coke oven gas supplied by the company's by-product ovens. There are six stoves in the furnace and each is supplied with gas by two cast iron pipes of 13 in. inside diameter. The air is heated by passing through the stoves under the furnace where it is raised to a temperature of 600 deg. Fahr. The air is furnished by a Sturtevant exhauster.

A 20-ton Morgan crane transfers the billets by magnet from a roller table in the billet mill to a loading dock from which they are discharged into the reheating furnace. The furnace heats from 400 to 425 tons in 24 hr. The rod mill building is commanded by a 25-ton Morgan electric traveling crane.

Press Safety Guard of Positive Type

A new safety guard for power presses known as the Kartzmark safety guard has been put on the market by the Standard Safety Mfg. Co., New Haven, Conn. The photograph shows a standard type of press with the guard attached, the main part of it being mounted on the side of the press body in place of the usual clutch actuating draw rod. A non-repeat cam is mounted on the press crankshaft which controls hold down for fender bar and housing.

When the operator depresses the treadle the fender bar and housing are brought down so that the fender housing surrounds the die block. If there is any interference, such as the operator's hand or even one finger, preventing the fender's closing entirely to the bolster



Safety Guard for Power Presses. When treadle is depressed the fender bar and housing are brought down so that fender housing surrounds the die block

plate, the latch cannot be withdrawn. This latch is shown at *A*. It is controlled by cam roller bearing shown at *B*. As the housing and fender bar reach the safety point with the fender resting on the bolster, the latch *A* is pulled, the cam on shaft holds it down until the cam has reached its destination, when another cam on shaft shown at *C* strikes the non-repeat lever *D*. This disconnects the treadle at latch *E* and draws the connecting link between the press latch and the guard latch shown at *F* back into position, thus relocking the press. The entire action is automatic, being cam controlled, thus leaving both hands of the operator free to handle work in and out of the machine.

Provision is made for limiting the upper travel of the fender bar and housing and also for adjustment for different heights of dies. This mechanism is also provided with an arrangement to compensate for tilting of the press, arrangement being similar to that usually employed on clutch draw rods.

The positive safety of this device was emphasized at the New Haven Machine Tool Exhibition recently when a blind man operated a press so equipped.

Additional equipment is being installed at the Youngstown plant of the Kalman Steel Co., Chicago, formerly the Paul J. Kalman Co., which will increase its productive capacity about one-third. The company plans to add another unit at Youngstown next spring, 60 x 376 ft.

Increase in Rates Not Justified

WASHINGTON, Oct. 24.—In an opinion made public last Friday, the Interstate Commerce Commission held as not having been justified an increase in the rate on iron and steel products in carloads from Midvale, Utah, in common point territory to destinations in California embraced in groups 3 and 4. The increase proposed was from 75c. to $1.08. It was stated by the carriers involved that steel interests of the San Francisco Bay region had complained that the 75c. rate was too low when compared with their rates to the group 3 and 4 destinations. The increase would have brought the Utah rate to the level of the Minnequa, Col., rate. The commission said it could not approve a parity in rates in which the Utah point had an advantage of about 600 miles in distance and that a spread of 33c. between rates to groups 1 and 2 and groups 3 and 4 seemed unwarranted in view of the fact that group 3 points were on the average only approximately 80 miles more distant.

Decreased Activity of Ohio Foundries

The trade report of the Ohio State Foundrymen's Association for the month of September shows that the actual melt of the foundries reporting decreased from 72 per cent of normal in August to 63 per cent in September. The total stock on hand shows considerable decrease, while the stock received shows also a sharp drop.

The association has established a nonferrous depart-

First Exhibition of a BLIND MAN
OPERATING A POWER PUNCH PRESS
is made possible by using
The KARTZMARK SAFETY GUARD
Manufactured by the
Standard Safety Mfg. Co., New Hav
W. H. ARION
67 years old, blind since 10 years
is having his first experience with a pow

Press Equipped with Safeguard Being Operated by Blind Man

ment from which reports will be received monthly and later sent out to the nonferrous members.

The convention and the annual meeting of the Foundrymen's Association will be held at Middletown, Ohio, Dec. 7 and 8. Some very interesting and instructive features are being prepared for this convention, details of which will be given later.

The benzol plant in connection with the by-product coke ovens of the St. Louis Coke & Chemical Co., Granite City, Ill., was put in operation recently. Indications are that the Illinois coal being used in the Roberts ovens will have a yield per ton of about 3.5 gal. of light oil, from which the recovery of motor fuel will be 2.85 gal.

Decision Favors Steel Corporation Roads

Interstate Commerce Commission Examiner Finds the Rates for Hauling Minnesota Ore Are Justified—Favors Reduction on Old Range Rates

BY L. W. MOFFETT

WASHINGTON, Oct. 24.—Line-haul freight rates on iron ore from the Gogebic range to Ashland, Wis., and from the Menominee and Marquette ranges to Escanaba, Mich., would be reduced 9c. per ton and from the Marquette range to Marquette, Mich., 4c. to 5c. per ton, while from the Minnesota ranges, the greatest source of supply of Lake Superior ore, they would be left unchanged if the Interstate Commerce Commission accepts recommendations made by Examiner Howard Hosmer. The present charge of 10c. per ton for dock service also would be left unchanged.

The examiner made these recommendations in connection with the well-known case of the Adriatic Mining Co., one of the most elaborately presented matters that has come before the commission in years in a single proceeding. As shown in the accompanying table, the examiner would reduce present line-haul rates from mines to upper docks to 72c. from 81c. from the Gogebic, Menominee and Marquette ranges, except in the case of the docks at Marquette, where he would reduce them from 58c. and 68c. to 54c. and 63c., the former applying from the Marquette range and the latter from the mines at Ishpeming and Negaunee, Mich. The table, however, includes the dock charge.

Many Corporations Complain

Complaints in the case, instituted Dec. 24, 1920, include 87 corporations operating iron mines in the Lake Superior region, identified with the independent steel companies, producing about one-half of the total output of the region. The commission was asked to establish rates which would not exceed the cost of performing the service plus an annual return of 6 per cent of the value of the property devoted to transporting and handling the ore. It also was charged that the present rates are violative of the second and third sections of the Interstate Commerce act because two of the defendants, Duluth, Missabe & Northern and the Duluth & Iron Range railroads, are controlled by the United States Steel Corporation, which, it was alleged, secures what is in effect a rebate. The contention regarding these lines was refuted by the examiner. Upon the publication of the increases in ore rates made by the Michigan lines in February, 1921, a supplemental complaint was filed, assailing those rates. Subsequently the Steel & Tube Co. of America and certain others of the original complainants operating mines in the Gogebic range were permitted to withdraw as complainants and join with the Hayes Mining Co. in filing a petition of intervention, adopting the allegations of the complaint and in addition making the contention that the rate from the Gogebic range to Ashland should be lower than the rates from the other principal ranges to their respective ports.

Charges Against Steel Corporation

Regarding the charges against the Steel Corporation lines, the examiner said the law does not prohibit the owning of a railroad by a shipper by means of stockholding and that the enactment of section 15a recognized the right of a railroad to earn more than 6 per cent because it provided for a recapture of only part of the return in excess of 6 per cent. Concerning the cost of service contention, the examiner said the ore produced by the Steel Corporation could be hauled for less than that of the independents as shown by previous reports of the commission. He made the calculation that under the excess profits tax law and the recapture clause of the Interstate Commerce law, adoption of the theory of rate making proposed by the complainants would leave the two Steel Corporation lines a return of only $5,456,803, which would be $1,984,431 less than the amount contributed by the Steel Corporation to the total excess income of the two carriers. Considering distances, cost of service, and other items, the examiner held that no reduction in rates from the Mesabi ranges, whose output is almost double that of the other ranges combined, was justified. This range is served by the Great Northern, and the two Steel Corporation roads. The report consists of 65 pages devoted to a thoroughgoing discussion of the rate situation in the Lake Superior region, methods of operation, cost, the various grades of ores and the system of handling them, production, etc. To show the relative shipments from the various ranges, the report gives figures by years from 1914 to 1921, inclusive. Taking the greatest year, 1916, when shipments totaled 66,439,000 gross tons, it is shown that 46,188,000 tons were shipped from the Mesabi, Vermillion and Cuyuna ranges, constituting the Minnesota ranges. Of this latter total, 42,525 tons were shipped from the Mesabi. It is stated that Steel Corporation roads hauled about 42 per cent of the tonnage of dock ore from the lake region in 1920 and 55 per cent in 1921.

Present, Proposed and Original Rates

The following table shows proposed, present, shippers' suggested rates and those applying at the time of the original complaint, in gross tons, on iron ore from Lake Superior mines to upper docks, including the dock charges, except when otherwise noted:

From	To	Examiner's Proposed Rates	Present	Original at Time of Complaint	*Complainants Asked
Minnesota ranges	Two Harbors, Minn. Duluth, Minn. Superior, Wis. Allouez, Wis.	91c.	91c.	$1	60c.
Gogebic range	Ashland, Wis.	82c.	91c.	85c.	51c.
Menominee and Marquette ranges	Escanaba, Mich.	82c.	91c.	85c.	51c.
Marquette range	Marquette, Mich.	64–73c.	68–78c.	65–75c.	45c.

*Line haul rates.

Enhanced Operating Costs

"It is urged by complainants that with the return of peace they are entitled to a removal of what they term the war-time, emergency increase in these rates," says the examiner in referring to the Minnesota range situation. "In answer to this contention it is sufficient to point out that the cause for that increase, enhanced operating costs, has been removed only in a small part. While complainants' rates were subjected to a greater increase under general order No. 28 (general increases of June 24, 1918) in comparison with other commodities, that inequality has been entirely wiped out by subsequent re-adjustments. As a result of general increases and reductions since June 24, 1918, the general level of rates in Western territory is 52 per cent higher than it was on the date mentioned, while the net increase in the ore rates from the Minnesota ranges during the

same period has been but 44 per cent. Ore rates shared in the general reduction of July 1, 1922, and the rate then ordered seems to have been fairly proportionate to the decreased costs of operation. Further reductions in operating expenses in the immediate future seem unlikely in view of the present trend of costs of labor, fuel and construction materials."

Regarding rates from the Gogebic, Menominee and Marquette ranges to Ashland and Escanaba, the examiner says that the increase of 10c. per ton in the line-haul to these ports in February, 1921, does not appear from the evidence of the carriers to have been warranted. The 1920 line-haul rate of 80c., reduced 10 per cent, would be 72c., and that amount, it is declared, would seem to be a reasonable maximum for the future. While there has never been a definite relationship between the rate to Ashland-Escanaba and that from the new ranges, it is stated, the difference in transportation conditions is so clearly in favor of the old ranges that their rates may properly be lower.

With respect to the line-haul rates of the lines serving Marquette, it is pointed out, it will be observed that the increase of February, 1921, made those rates 118 per cent higher than they were after the 15 per cent increase in July, 1917. This total increase was declared to have been larger than was made in the same period in any of the other ore rates involved in the case and was excessive in comparison with the increases made on general traffic.

"No sufficient reason for the 5c. increase in the line-haul rates to Marquette appears of record," says the report. "Had that increase not been made, those rates would now be 54c. and 63c. The record indicates that those amounts would be reasonable maxima for the future."

Some iron ore shippers have interpreted the tentative report to be an attempt simply to treat iron ore in the same way in which all other commodities have been treated and to wipe out the effect of all special adjustments. This, it is pointed out, would mean that iron ore would be in a position of having in the Northwest paid a special tax through an excessive increase of 15c. a ton during the war period and beyond, and it is now proposed to put it back into the common bag as if it never had any special consideration either for or against it.

CHAIRMAN SCHWAB CONFIDENT

Sounds Optimistic Note at Meeting of Associated Industries of Massachusetts

The seventh annual meeting of the Associated Industries of Massachusetts was held Tuesday, Oct. 17, and Wednesday, Oct. 18, at the Copley-Plaza and the Westminster hotels, Boston. It was the most succesful affair of its kind ever held by the organization. Col. Charles R. Gow, Charles R. Gow Co., Boston, was reelected president; Winslow Blanchard, Blanchard Machine Co., Cambridge, treasurer, and George R. Conroy, literary secretary.

A long list of speakers talked on various subjects of interest to the 1600 member industrial concerns, as well as upon national and international affairs. The speakers included Arthur H. Young, manager industrial relations department of the International Harvester Co., Chicago, who talked on experiments in occupational rating and wage setting; Hon. Walker D. Hines, former director general of railroads, New York, who spoke on some phases of the railroad problem and upon industrial conditions abroad; Howard Coonley, president Walworth Mfg. Co., Boston, who talked on the subject of wage adjustments; Harrison E. Howe, editor *Journal of Industrial and Engineering Chemistry*, Washington, who gave an address on commercial phases of modern science; and Harry M. Hope, president Harry M. Hope Engineering Co., Boston, who pointed out how money can be saved in the use of fuel.

Banquet Largely Attended

Charles M. Schwab, chairman of the board, Bethlehem Steel Corporation, was the chief speaker of the evening at the banquet on Tuesday evening, which was attended by 1300, including the wives and daughters of many members. Mr. Schwab touched on many important questions of the day during his informal talk, but the keynote of his message was confidence in the outlook for industry and in the future of these United States.

"With natural resources such as no other nation in the world possesses, this country is destined to become the workshop of the world and to supply the needs and comforts of other peoples," said Mr. Schwab. "If I were younger, I would give up all I have accomplished during my business career of 43 years to begin again in the lowliest capacity, for I am convinced that the development of industry in the United States has only just begun."

At another point he said: "The industries of Massachusetts and of New England are going to be all right even if they have slackened temporarily. I have interests in Boston and elsewhere in New England. They are not paying very well just now, but times are going to be good here before many years. Don't be afraid to risk your dollars in New England industries. You have the highest class of labor in the world here and the old New England tradition is worth something."

In speaking of working conditions of the 150,000 Bethlehem employees, Mr. Schwab said he had always thought of industry as a three-legged stool. There is capital, there is management, and there is labor. "The stool cannot stand unless it has all three legs and the legs must give equal support. Without the good will and the loyalty of the working force a business will soon find itself in the bankruptcy court. The man who has his labor to sell has as good a right to bargain for it as his prospective boss has. I will have no man from Kamchatka come into Bethlehem or Fore River and tell us what to do."

How Disputes Are Handled

Mr. Schwab then explained how disputes and questions pertaining to working conditions are handled at his plants. There is a group of delegates elected on the same basis as the National House, and there are representatives of management, which corresponds to the Senate. This system has taught the workingman how to express freely his views. When, during the recent business depression, it became necessary to cut wages, which was done three different times, the position of the corporation as to profits, losses, etc., was put squarely up to the workmen. The situation was accepted by everybody and Mr. Schwab challenged anybody to find a disgruntled employee.

Mr. Schwab stated his views on the treatment of labor as an offset to some of the things that had been previously said by Prof. G. W. Dyer, Nashville, Tenn., who had maintained that the cost of living had no legitimate connection with wages inasmuch as the scale of wages paid labor was distorted, and the theory being that farm labor's wages were all out of proportion with union wages and that the cost of living to the farmer in this instance had no relation to compensation. A job doesn't mean wages, to Mr. Schwab's way of thinking, but it does mean opportunity.

Many who listened to Mr. Schwab were impressed with the progress made by the steel industry during his association with it. When he started in the game in 1879, the country was producing 1,000,000 tons of steel annually, he said, while to-day it can turn out more than 50,000,000 tons. "During these 43 years in the industry, the angel of good luck seems to have hovered about my life. Yet I have worked as hard and as conscientiously as any man in the United States."

Throughout his remarks, Mr. Schwab injected many interesting stories in connection with the steel industry and his home life. During his stay in Boston, he talked before the student bodies at Harvard University and the Institute of Technology and addressed the members of the Boston Chamber of Commerce.

National Problems at Implement Meeting

Gap Between Farmers' Selling and Buying Prices Widening—Foreign Trade Prospects Poor—Compulsory Arbitration of Industrial Disputes Urged

"THE entire business world must soon come to realize that the price of the products of labor to the American farmer cannot be upon a basis relatively higher than the price that he receives for the products of the soil and enable him to continue to keep our great industrial and transportation systems operating upon a prosperous plane," declared F. R. Todd, vice-president Deere & Co., Moline, Ill., in addressing the twenty-ninth annual convention of the National Association of Farm Equipment Manufacturers, held at Chicago, Oct. 18 to 20. Agricultural implement manufacturers have recognized this interrelationship of prices, but, he added, "not until it is also recognized in other lines of industry, and most of all, in our great mining and transportation fields, can we hope to re-establish the buying power of 50 per cent of our population classed as rural inhabitants, upon a basis which will insure continuous and profitable operation of industry."

Gradual declines in implement prices during the year have brought them to a point approximately 42 per cent above the pre-war level. "Fortunately, during 1922 there has been an upward tendency in prices of farm products, until those prices are now upon a basis approximately 31 per cent above the pre-war level, so that at the close of the season of 1922 the buying power of the farmer, in terms of implements, had been substantially re-established. As a result, while the industry met with very serious declines in volume during the first few months of the year, the later months have shown substantial increases, but as yet the demand has been but little more than 50 per cent of normal and the entire year's business of 1922 but little better, from a tonnage standpoint, than that of 1921.

"The conditions maintaining in the spring of 1922, exhibiting, as they did, a general and continuing tendency for price reduction in materials, which make up about 75 per cent of the total warehouse cost of our implements, gave us courage to believe that we would be able, for the year 1923, to fully re-establish our prices upon the basis of the farmer's buying power and thus return to somewhere near normal condition. . . . Notwithstanding the settlement of the coal and railroad strikes, accumulated orders, shortage of cars and other strike influences have resulted in further market advances. On Sept. 11 material prices were 93.1 per cent above 1914 levels and Oct. 6, 99.9 per cent above. The following table, containing a list of the principal items of materials used in implement construction, and covering the period from Nov. 15, 1921, down approximately to date, shows percentages of increase over 1914, at the various dates indicated, and clearly illustrates the cost problems with which the industry is faced. The prices are in all cases computed f.o.b. Moline:

Price Increases Above 1914 in Terms of Percentage

	Nov. 15, 1921	Nov. 28, 1921	Jan. 3, 1922	Mar. 1, 1922	Apr. 22, 1922	May 23, 1922	July 20, 1922	Sept. 11, 1922	Oct. 6, 1922
Hot-rolled bars	44	31	27	19.6	28.3	35.6	38	52.5	56.2
Cold-rolled steel	51	51	45	44	44	50	53.3	77.6	77.6
Bar iron	63	63	63	58.1	69.3	69.3	81.9	123.7	147
Sheet steel (blue annealed)	102	85	85	84.1	94.3	94.3	91.2	98	98
Bolts, nuts and rivets	100	100	93	89.5	121	146	152.6	184.2	184.2
Soft center steel	102	102	102	72.6	72.6	78.4	94.7	94.7	116.2
Solid plow steel	141	141	141	118.2	118.2	118.2	116.2	138.1	160.1
Malleable iron	115	100	100	100	100	100	115.4	123.1	146.1
Pig iron	73	59	52	54.7	65.3	79.4	85.6	142.2	142.2
Coke	171	171	162	160.4	160.4	160.4	165	237.9	237.9
Steam coal	149	149	149	149	149	149	149	265	258.6
Fuel oil	91	91	91	91	91	91	57.1	78.3	78.3
Lumber	80	80	80	80	80	80	90.7	90.7	90.7

"The annual reports of implement companies for the year 1921 have shown very substantial losses," said Mr. Todd. "Economies effected in 1922, reductions in inventories, decreased interest charges, etc., have somewhat improved the 1922 conditions, yet have not enabled implement producers to place their affairs upon a profitable basis. I apprehend that the annual reports for 1922 will show further losses.

"With such a picture of the cost situation as I have painted above, and with the full knowledge that our industry has been operating without profit, management is confronted with a most serious problem in determining the price basis of implements for the coming year. If the ordinary commercial practice were to be followed and the prices of our products properly related to their costs, advances from 10 per cent to 15 per cent should have been made; however, implement manufacturers fully appreciate that the farmer's buying power is so reduced below normal that a radical advance in the price of implements would so materially decrease demand as to necessitate the reduction of factory forces and involve very serious financial loss because of curtailed operation."

Lack of Purchasing Power Blocks Foreign Trade

"We have for the foreign field a line of goods that is both needed and desired, the means of manufacturing them on a sound economic basis, and the organization properly to present them. But when we come to the fourth element, we come to the present trouble—the great and seemingly insurmountable trouble of the customer's financial inability to buy," said George A. Ranney, treasurer International Harvester Co., in discussing the effect of European conditions on foreign trade. "Taking Europe as a whole, the conditions are not favorable for American exports, except in the form of raw materials or foodstuffs, and even as to those commodities Europe's purchasing power is limited."

Railroad Expansion Looked For

"The railroads have been handicapped by adverse conditions in carrying out their program for keeping facilities and equipment up to the needs of the country," said C. H. Markham, president Illinois Central R. R., in discussing "The Transportation Problems of 1922." He said: "They began falling behind several years before the World War, when rates were so low that earnings were depressed and investors were driven to other markets. There was a decided decline in new mileage built and equipment bought. During the ten years ending 1917 the railroads installed an average of 2677 locomotives each year, of which 1696 went to take the places of engines that were sent to the scrap heap. During the last four years, however, they have added an average of only 1772 locomotives a year, or only 76 more than they formerly sent to the scrap heap each year. During these four years the rate at which locomotives have been retired from service dropped to an average of 1073 a year, which means that the railroads, in order to handle the business of the country, had to keep in service locomotives that should be placed on the retired list. The same is true of other kinds of equipment. During the 10 years ending with 1917, the railroads added an average of 120,254 freight cars a year and retired 82,416 a year, while during the last four years they have been able to add an average of only 59,740 a year and retire an average of only 59,258 a year."

Equipment Orders This Year

Mr. Markham showed that the carriers had failed by a wide margin to realize the earnings upon which rates

have been based under the Transportation Act, but added, "the revenues of the railroads will be increased as traffic continues to grow, and the financial reports of the railroads this fall and winter probably will be materially improved. In anticipation of this increase, the market for railway investments has already picked up, and since the first of this year the railroads have been making more extensive investments. During the nine months, Jan. 1 to Sept. 30, this year, the railroads placed orders for 1649 locomotives, which was more than seven times the number during the whole of last year; 112,920 freight cars, which was nearly five times the number ordered during the whole of 1921, and 1437 passenger cars, which was about six times the number ordered in 1921.

"It is to the interest of every man engaged in gainful occupation that the railroads shall be permitted to expand as the business of the country expands. In order to do this they must be allowed to adjust their freight and passenger rates, the rates of pay of their employees and other items of income and outgo so that their net earnings will be sufficient to attract investors to railway securities. . . . I believe that the railroads, because of their fundamental importance to the welfare of all other business, should be operated under the supervision of agencies controlled by the public. The blame for past abuses lies not in regulation itself, but in the fact that regulation has not at all times been intelligently inspired and directed. While removing regulation would correct some abuses, the proper way of insuring railway progress is to educate the public on railway matters so that regulation will be fair and constructive.

Advocates Arbitration of Industrial Disputes

"The losses and social disturbances caused by the strikes of coal miners and railway shopmen during the past summer have focused the attention of many thinking people upon the undesirability of strikes as a means of settling disputes between employers and employees," declared Mr. Markham. "Strikes are civil warfare. When any group of individuals attempts to force the public to accept its demands, without regard to their merit, it is a declaration of war against organized society. . . . The fact that strikes may sometimes be the means of enforcing meritorius demands does not hide their evil aspect.

"There is no peaceful way of settling disputes except by the methods of arbitration. Arbitration is the only way which has respect for the rights of both parties to the dispute and for the rights of the public. Recognizing this fact, we have established courts for the arbitration of the numerous individual controversies which spring from the relations of individual members of the community, and we are seeking to carry out the principle of arbitration in the settlement of international disputes. I submit that the principle must be applied to the settlement of industrial disputes which threaten to jeopardize the rights of the public. . . . The railway shopmen lost their strike because they attempted to jeopardize the interests of the public and overthrow the decisions of the United States Railroad Labor Board, regardless of the merits of their demands. In the end they found it necessary to go back to work and take up their grievances in the manner provided for the settlement of such disputes, of which they could have availed themselves without a resort to force and without creating a national upheaval."

Would Make Railroad Strike a Felony

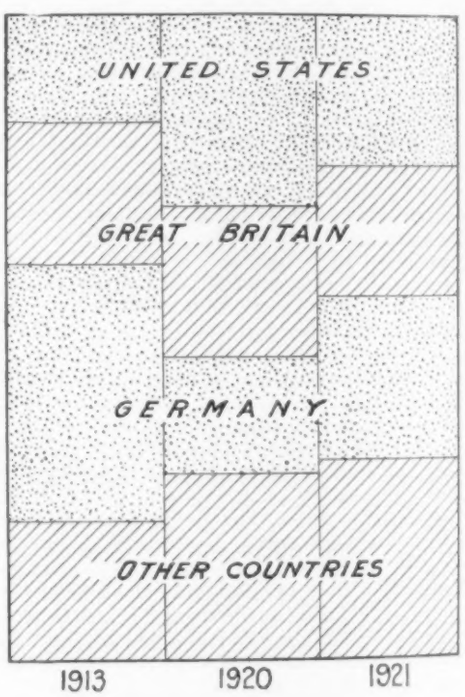
Enactment of a law placing railroad employees in a preferred class, with wages fixed periodically upon a slightly higher basis than those paid in other industries, but predicating the passage of such a measure upon making railroad strikes a felony, was proposed by W. H. Stackhouse, general manager French & Hecht, Davenport, Iowa, in an address on "Industrial Freedom." "Such a measure," he declared, "should effectively protect the country from a repetition of the disastrous strike through which it recently passed and usher in an era of comparative tranquillity in so far as the nation's railroad transportation industry is concerned, especially if employment would at all times be open to men and women of proper qualifications, regardless of their affiliation or non-affiliation with any organization whatever."

At the closing session of the convention, J. B. Bartholomew, president Avery Co., Peoria, Ill., was elected president of the association. F. R. Todd was chosen chairman of the executive committee.

French Imports of Machinery and Tools

Figures of the Department of Commerce show that the United States' participation in French imports of machinery advanced from 16.2 per cent of the total in 1913 to 29.6 per cent in 1920 and fell to 23.25 per cent in 1921. At the same time British machinery received by France advanced from 21.6 per cent of the total in 1913 to 23.1 per cent in 1920, but fell to 19.9 per cent in 1921, and German machinery accounted for 40.1 per cent in 1913, 18.1 per cent in 1920 and 25.3 per cent in 1921. French imports of machinery from smaller countries, notably Belgium, showed a consistent gain, from 22.1 per cent of the total in 1913 to 29.2 per cent in 1920 and 31.55 per cent in 1921. All of this is shown on the chart. The table shows that the United States, third in 1913, became first in 1920 and fell to second place, behind Germany, in 1921.

In tools and metal work a different story is told. The United States share was only 4.3 per cent in 1913,



Sources in 1913, 1920 and 1921 of French Imports of Machinery, in Tons. The chart shows proportions only

advancing to 15.7 per cent in 1920 and falling to 5.1 per cent in 1921. Meanwhile Great Britain, with less than half as much as Germany in 1913, advanced in 1920 to a commanding lead, only to lose it again to Germany the next year. In 1920 the United States led Germany and occupied second place. All quantities are expressed in metric tons.

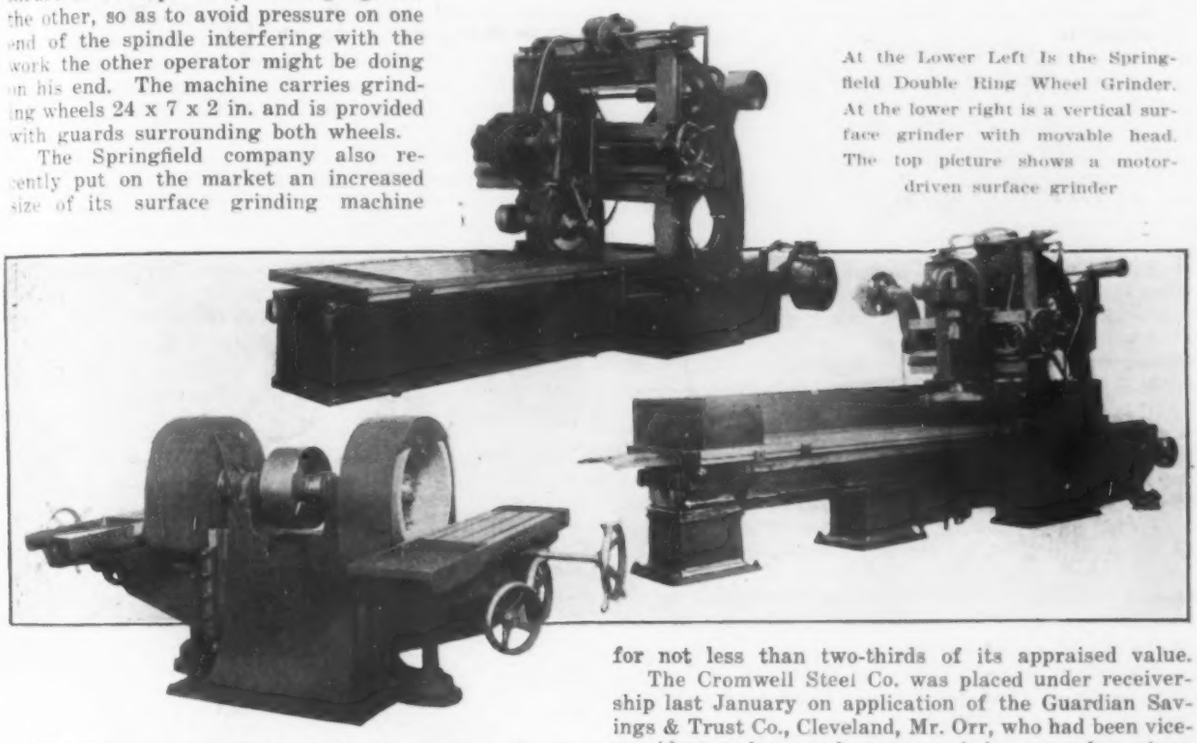
Machinery	1913	1920	1921
From United States	35,921	110,007	65,348
From Great Britain	47,738	85,861	55,946
From Germany	88,845	67,278	71,029
From all others	48,935	108,733	88,683
Total imports	221,439	371,879	281,006
Tools and Metal Work			
From United States	3,394	29,556	5,254
From Great Britain	13,027	48,753	13,739
From Germany	28,838	27,098	20,298
From all others	33,400	83,173	63,071
Total imports	78,659	188,580	102,362

For Saving Floor Space in Production Grinding

A double end ring-wheel type of surface grinder was recently put out by the Springfield Mfg. Co., Bridgeport, Conn. The machine was originally developed for use by pump manufacturers for grinding various flat surfaces and was designed to save floor space in that it permits two operators to work on one machine.

This machine has a table traverse capacity of 30-in. with a spindle, 3-in. in diameter, running in bronze bearing. S. K. F. thrust bearings are provided on the inside of each box, these being furnished to absorb the thrust of one operator, working against the other, so as to avoid pressure on one end of the spindle interfering with the work the other operator might be doing on his end. The machine carries grinding wheels 24 x 7 x 2 in. and is provided with guards surrounding both wheels.

The Springfield company also recently put on the market an increased size of its surface grinding machine



At the Lower Left Is the Springfield Double Ring Wheel Grinder. At the lower right is a vertical surface grinder with movable head. The top picture shows a motor-driven surface grinder

of the planer type. This machine has a capacity for grinding 36 in. in width and 8 ft. in length. While this type of machine was originally developed for grinding large dies, the increased size provides a machine capable of handling a large general class of grinding work. This machine is entirely motor-driven, the main motor being mounted on the shelf between the housing. The motor for driving the wheel spindle is mounted directly on the wheel head itself and traverses with it. This machine is the No. 7 surface grinder.

The Springfield company has also developed the vertical surface grinder with movable head into a large size machine for grinding steel flasks and other miscellaneous work, the machine shown having a capacity to grind 42-in. in width by 10-ft. in length and while this type of machine was originally developed for grinding dies of large size, it is now being used for a general class of work, such as, grinding automobile engines, crank cases, oil tanks, and top and bottom of cylinders. This machine is also built with motor drive, the motor mounted on a bracket between the housing and driving both the wheel head and the table.

The Carnegie Steel Co. is considering a resumption at its Bellaire, Ohio works, which has been idle for 19 months. There are two blast furnaces at this plant, while the steel works comprise two 10-ton Bessemer converters, three cupolas and a 250-ton mixer. The annual capacity of the plant is 420,000 tons of ingots, yielding 364,000 tons of sheet and tin plate bars, which go largely to Wheeling district mills of the American Sheet & Tin Plate Co.

The Midwest Steel & Supply Co., Inc., 28 West Forty-fourth Street, New York, has opened an office in Philadelphia, Machinery Exhibit, the Bourse. Layton F. Smith is in charge.

Cromwell Steel Co. Plant and Equipment to Be Sold at Auction

The plant, equipment and real estate of the Cromwell Steel Co., Lorain, Ohio, will be sold at public auction at the Lorain County Court House in Elyria, Nov. 22, at 11 a. m., according to announcement by C. A. Orr, master commissioner in bankruptcy. The plant includes four 90-ton open-hearth furnaces, three soaking pits, one 20-ton hammer, one 30-in. two high two stand reversing bar mill and auxiliary equipment. The plant occupies a 300-acre site. The property has been appraised at $1,650,000 and must, it is stated, be sold for not less than two-thirds of its appraised value.

The Cromwell Steel Co. was placed under receivership last January on application of the Guardian Savings & Trust Co., Cleveland, Mr. Orr, who had been vice-president and general manager, being named receiver. At that time, it was announced that the liabilities of the company included $2,000,000 in bonds on which interest had been defaulted, and about $1,000,000 in notes and accounts.

Shipments to Foreign Countries

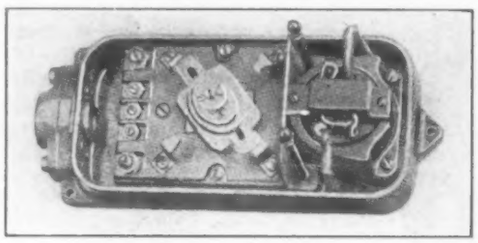
SPRINGFIELD, Ohio, Oct. 24.—Foreign orders were recently received by the Springfield works of The International Harvester Co. from Sydney and Brisbane, Australia. These are for speed trucks with the right-hand drive. Shipments to South America are being made by the American Seeding Machine Co. These are going forward at the rate of about three carloads of grain drills per day.

The Thomas Mfg. Co. is getting out mowers with tractor hitch to fill a good sized order from South America. Its last shipment of grain drills to that country was forwarded Oct. 1.

A new car storage shed 90 x 380 ft. is being built for the Apollo Steel Co., Apollo, Pa., adjacent to the newer part of the plant of that company. Steel for this addition will be fabricated and erected by McClintic-Marshall Co., Pittsburgh, and with its completion the company will have storage capacity for 20,000 tons of sheet bars in addition to its present capacity of 10,000 tons. The new shed will be served by a 15-ton overhead traveling crane and will be equipped with a new style of shear built by United Engineering & Foundry Co., Pittsburgh. This shear is a heavy one and of special design and can cut cold at one time two slabs, 12 in. wide, with an aggregate thickness of three inches. The company recently completed the installation of two new galvanizing pots, each capable of taking 48 wide sheets at one time.

Motor Operated Snap Switch for Automatic Applications

A new motor-operated snap switch that can be used on either alternating or direct current, and is applicable wherever the automatic operation of electrical devices is desired, has been perfected by the Westinghouse Electric & Mfg. Co. With mechanisms such as thermostats, pressure gages, time clocks and floats, the switch can be used to regulate electric heaters for heating water, oil or other liquids; the temperature in electric ovens of all kinds; the height of liquids in tanks and a number of other purposes. In a factory this switch is



The Snap Switch Is Operated by the Small Motor, Which in Turn Is Actuated by Automatic Control Apparatus, Such as a Thermostat

especially useful when applied to electrical devices that should be started before the working day, such as forges and pre-heating furnaces.

The motor-operated switch consists of a heavy snap switch with a motor geared to the switch shaft. When the switch-motor circuit is closed, as by a thermostat, the motor throws the snap switch into its other position from that shown, putting the heater or other apparatus, as the case may be, on the line and at the same time opening the circuit of the switch motor. The next operation of the snap switch opens the circuit and so on. The motor is on the circuit for only a short time at each operation and draws 0.4 amp. at, say, 110 volts.

The switch has withstood severe service tests. The contacts and moving parts are mounted on a porcelain base which is fastened in a cast iron base on three bosses. The intermediate gears between the motor and the switch shaft are mounted on the floor of the base casting, and the motor is a unit mounted on the base casting. The switch parts are the standard Westinghouse parts. The motor is of the series type which can be used on alternating or direct currents. The frame and field poles are cast iron, and the bearings are of special self-lubricating material. The cover of the switch is of cast iron lined with the insulating material to prevent any possibility of the grounding of the contacts.

Donner Steel Co. in Alloy Field

The Donner Steel Co., Inc., Buffalo, N. Y., has taken up aggressively the manufacture of alloy steel. It has entered the market to furnish standard grades of alloy steel, such as nickel steels, chrome-nickel and chromium steel and chrome vanadium and molybdenum steel, together with the various combinations of these alloys in both bar and billet form within the company's ranges of sizes.

The manufacture of the alloy steels is under the direct supervision of James A. Buell, formerly of the United Alloy Steel Corporation, Canton, Ohio, who recently joined the Donner organization as general superintendent.

New Chief of Foreign Division

Promotion of Walter L. Miller of Washington to be chief of the Foreign Service Division of the Bureau of Foreign and Domestic Commerce, has been approved by Secretary of Commerce Hoover. The task of promoting the growth of American foreign trade as well as supervising the activities of Government commercial agents in all foreign fields will be under Mr. Miller's direction. Mr. Miller has been assistant chief of the Foreign Service Division and succeeds H. Dotterer, who has been assigned as chief of another division.

Crystallization of Galvanized Malleable Iron Castings

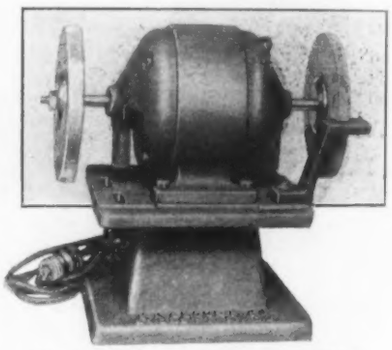
For many years manufacturers of malleable iron have had trouble with the users of castings that are hot-dip galvanized because frequently such castings, though of good quality, after galvanizing have become brittle. The manufacturer was accused of making poor malleable, while in reality the trouble was caused by the hot galvanizing. At the present time most manufacturers of malleable castings, realizing this, will assume no responsibility for the breakage of such castings after being galvanized.

The Eastern Malleable Iron Co., large producer of castings that are galvanized, experienced for many years similar difficulties and tried in many ways to overcome them but were unsuccessful. During the past two years its research department made a special effort in this direction and, after months of study and experimenting, claims to have solved the difficulty.

Not so much difficulty has been experienced by crystallization of tinned malleable iron castings, although this sometimes occurs, and the same method used to overcome the trouble in galvanizing also applies to tinning.

Combination Grinding and Buffing Machine

The Blount Special plain bearing, combination motor grinder and buff, shown in the accompanying illustration, has been added to the line of machine tool equipment manufactured by the J. G. Blount Co,, Everett,



Combination Grinding and Buffing Wheel for Light Work

Mass. It is equipped with a standard Westinghouse ¼-hp., 1800-r.p.m. motor, for alternating or direct current. The equipment includes a 6 x ½-in. standard grinding wheel, medium grit, a tool rest for the right hand side, a 7 x ⅜-in. buff wheel (sewed), and attaching cord with standard plug. The range of uses includes grinding tools, smoothing small castings, grinding lathe tools, and the like.

Canadian Rail Order

TORONTO, Oct. 23.—The Grand Trunk Railway has placed an order with the British Empire Steel Corporation for 25,000 tons of 100-lb. rails for delivery next spring. The rails will be rolled at the Sydney, N. S., plant of the Dominion Steel Corporation, and insure an uninterrupted winter's work for the 3,000 men employed there. Other orders the company has on hand will keep the mill in operation until the first of the year, and the spring delivery feature of the new order will enable the company to wait until the turn of the year before starting rolling on this account.

At the Pittsburgh, Pa., experiment station of the Bureau of Mines heat-treatment experiments, including quenching and annealing, have been conducted on a number of cast non-ferrous alloys including the following: 88:10:2, Cu-Sn-Zn; 85:5:5:5, Cu-Sn-Zn-Pb; 85:4:5:6, Cu-Sn-Zn-Pb; 90:10, Cu-Sn; 90:6:3:1, Cu-Sn-Zn-Pb; 85:15, Cu-Sn; 86:4:6:3:1, Cu-Ni-Sn-Zn-Pb; and 89.9:10:0.1, Cu-Sn-P. The results are being summarized.

CAST IRON PIPE MAKING

Decrease in Value of Products but Increase in Number of Shops

WASHINGTON, Oct. 24.—The Department of Commerce announces that the census reports show a decrease in the value of products of plants engaged primarily in the manufacture of cast-iron pipe during the year 1921 as compared with 1919. In 1921, 69 shops reported products amounting to $43,899,469, as compared with 59 having products valued at $50,235,101 in 1919, a decrease of 12.6 per cent in value of products.

Notwithstanding the decrease in value of products, which was accompanied by decreases in the number of persons employed, in the amount paid during the year for salaries and wages, and in the cost of materials used, there was an increased number of plants, and the tonnage output was greater in 1921 than in 1919. There were 7 new shops reported, and three which were assigned to another industry classification at the previous census reported cast-iron pipe as their chief product in 1921.

Of the 69 reporting in 1921, 25 were located in Alabama; 8 in New Jersey; 7 in Pennsylvania; 6 each in New York and Ohio; 3 each in Tennessee and Virginia; 2 each in Iowa and Massachusetts and 1 each in California, Georgia, Illinois, Indiana, North Carolina, Oregon and Wisconsin. Alabama, the leading state in the industry in 1921, produced 35.2 per cent of the total value of products in that year.

In November, the month of maximum employment, 13,895 wage earners were reported, and in January, the month of minimum employment, 10,183; the minimum representing 73.3 per cent of the maximum. The average number employed during the year was 12,428 in 1921 as compared with 12,625 in 1919. A classification with reference to prevailing hours of labor in the establishments in which employed shows that for 1218, or 9.8 per cent of the total (average) number of wage earners the prevailing hours per week were 44 or less; for 1601, or 12.9 per cent, the hours were 48 per week; for 5639, or 45.4 per cent, 54; and for 3478, or 28 per cent, from 54 to 60.

The returns indicate that the combined output of all establishments was approximately 52.5 per cent of the maximum capacity, based upon a demand requiring full running time. The percentage of output of individual establishments ranged from 5 to 100 per cent of the maximum capacity.

Nickelized Zinc in Ribbon Form

Nickelized zinc in coils or ribbon form is now obainable, the American Nickeloid Co., Peru, Ill., having perfected a process for making this form of nickelized zinc as well as sheets of the same material. The product is intended for manufacturers of metal stampings and novelties. The object of using this form of nickelized zinc, which is given the name of Ribbonoid, is that it requires no plating or refinishing after the stamping. The ribbonoid is furnished in coils of continuous lengths, ranging from 175 to 525 ft. and from ¼ to 12 in. in width.

What Compressed Air Does in Industry

One of the latest motion picture films produced through the collaboration of manufacturers, the Bureau of Foreign and Domestic Commerce and the Bureau of Mines, to show methods of production and the manner in which machinery and apparatus of various sorts are utilized in different fields of activity is one entitled, "The Story of Compressed Air." It is the outcome of the joint efforts of the Department of Commerce, the United States Bureau of Mines and the Compressed Air Society.

To give some idea of the scope, it may be stated there are 121 pictures on three lines. They include the modern foundry which rams molds, sifts sand, removes cores, and cleans, chips and grinds castings by means of air; drilling, reaming, and tapping of metal by pneumatic tools; the air riveter; boiler and condenser tubes being cleaned and packed by compressed air; testing containers for leakage by the use of compressed air, and the cement-gun. Particulars regarding the use of the film will be furnished by the Department of Commerce, the Bureau of Mines, both in Washington, or by the Compressed Air Society, 50 Church Street, New York.

Wire and Spring Plants Busy

The Morgan and National plants of the Wickwire-Spencer Steel Corporation, Worcester, Mass., which were last to feel the revival of business, are now operating full and the company's works in Massachusetts, embracing Worcester, Palmer, Spencer and Clinton, are now on an estimated 90 per cent basis of production as compared with previous high peaks. The National works, formerly the National Mfg. Co., manufactures wire goods and kitchen specialties, and is operating overtime with extra help. The Morgan plant, formerly the Morgan Spring Co., is operating on a night and day basis and is receiving a large percentage of emergency orders requiring delivery by express, many customers having permitted their stocks of springs to get low. The improvement is not only from the automobile and agricultural machinery trades, but from consumers generally. The company is now employing 3400 people in Massachusetts, of whom 2400 are on the payrolls of the Wright, Goddard, National and Morgan works at Worcester.

The work of replacing the fine wire-drawing building at Spencer, Mass., which was burned in August, is proceeding rapidly and it should be ready for occupancy in a fortnight. The structure is 40 by 80 ft., three stories.

September Refractories Statistics

The Refractories Manufacturers' Association has issued its monthly statistical data relative to production, shipments, orders, stocks, etc., of fire clay and silica brick for the month ended Sept. 30. The figures follow:

	Fire Clay		Silica	
Capacity	74,456,394		23,998,333	
Stock Aug. 31	152,183,738	(204)	31,285,797	(130)
Produced, September	46,241,911	(62)	11,295,216	(47)
Shipped, September	49,903,554	(67)	9,962,934	(41)
Stock Sept. 30	148,522,095	(199)	32,618,079	(136)
New orders, September	56,781,987	(76)	11,155,828	(46)
Cancellations	201,569	(0)	27,119	(0)
Net new business	56,580,418	(76)	11,128,709	(46)
Unfilled orders	75,238,631	(101)	18,506,273	(77)

The quantities given are the totals sent in by those who reported and the capacity figure is the combined economical producing capacity of those who sent in figures. The figures in parenthesis are percentages arrived at by dividing the total economical producing monthly capacity into the figures given.

Columbus Stack Resumes

The American Rolling Mill Co., Middletown, on Oct. 23, put its second Columbus furnace in blast. This gives the company three of four stacks in operation, one Ashland furnace being down for repairs. The Middletown plant is running full, eight open-hearth furnaces being on last week, with all sheet mills operating. Transportation conditions cut off the Middletown plant from its coal supply for several weeks, but continuous operations were maintained through the use of oil burning equipment in open-hearth and heating furnaces.

O. E. Guilbert, formerly a director of the Pittsburgh-Des Moines Steel Co., Pittsburgh, is head of the Guilbert Steel Co., which will build a steel fabricating plant on a site on Everett and Railroad Streets, West Side, Pittsburgh. Pittsburgh City Council recently passed an order, which has been signed by the mayor, vacating portions of Everett and Railroad Streets to make room for the plant site. The company expects to start work on the new plant immediately and to put out inquiries for equipment in about a month.

SERIOUS LABOR PROBLEM

Immigration Policy's Effect on Industry—Wholesale Prices Advance

In its review of industrial conditions, the National Industrial Conference Board says:

"The immigration problem is rapidly assuming a position of commanding importance, particularly with reference to industry and employment. The effects of restriction under the per centum immigration law are now making themselves felt and the results give food for very serious thought. Under this law the number of immigrants from any country is fixed at one-third of the pre-war average. In practice an even smaller proportion has actually been admitted. The number of aliens arriving has been greatly reduced and the number of those departing has been much increased. For the twelve months ending June 30 last the number of aliens arriving in the United States totaled 310,000, while the number of aliens departing reached the large total of 200,000.

"The effect on the labor supply of this country, particularly upon the supply of unskilled labor, is likely to be of far-reaching importance, especially so if the number of aliens departing continues in such large volume.

"Not only has net immigration been largely reduced, but the character of the immigrants has changed very definitely. Fewer and fewer skilled workers are arriving; a larger and larger proportion of women and children—non-wage earners—is observed; the national groups from which our industrial workers are drawn actually show a surplus of emigrants, while the non-industrial types show an increase. It is obvious that the mathematical formula which has been applied to the immigration problem has not given satisfactory results.

"Wholesale commodity prices have recently shown renewed strength. The steady upswing of the early part of 1922 continues. Raw materials have been particularly strong and have shown increases averaging about 20 per cent since January. This indicates strong underlying factors which may force a continuous upward trend of wholesale prices in the near future.

"So far and with the exception of coal, these upward tendencies have not made themselves felt in retail prices. The index of the United States Bureau of Labor Statistics has remained almost stationary since June. The index of the National Industrial Conference Board has also registered very little change. On Sept. 15 it stood at 155.6 as compared with 154.5 on Aug. 15, which represents an increase of 1.1 points or seven-tenths of 1 per cent. The July and June figures showed only a very slight decrease. Usually in the course of an upward price movement, retail prices rise more slowly than wholesale prices and in the course of a downward movement retail prices drop more slowly. There is a possibility, therefore, that the upward movement of wholesale prices will be only slowly translated into higher retail prices and that the cost of living will not be seriously affected."

Increased Employment at Milwaukee

MILWAUKEE, WIS., Oct. 23.—Employment in the iron and steel group of Milwaukee industries increased 2.8 per cent between Sept. 1 and Oct. 1, according to official figures of the Industrial Commission of Wisconsin. For the entire state the gain was 1.8 per cent. In Milwaukee the increase is accounted for chiefly by makers of tools, milling machines, steel castings and gears. Employment slackened slightly with business in automotive parts and accessories, which experienced the usual seasonal let-down.

The monthly business and financial review of the largest bank in Milwaukee says: "Returns from 17 large Milwaukee industrial firms indicate that the average rate being paid for common labor at the end of September was approximately the same as on the same date in 1921. The metal trades, however, are paying an average of 4c. per hr. more than a year ago. The average industrial rate being paid for all lines is about 40c. an hr.

"Foundries, machine shops and machine tool makers generally report increased activity during the past month, with prospects for the future brightening," the report says.

More Metal Workers and Higher Wages

Iron and steel plants, according to figures of the Bureau of Labor Statistics, show for September a loss from August of 3106 employees in 126 establishments. This loss of 1.9 per cent was accompanied by a gain of 7.6 per cent in amount of payroll and a corresponding increase in the average pay envelope from $49.07 to $53.74, or 9.5 per cent.

In the automobile industry there was a gain in 97 establishments of ½ per cent in number of employees and a decrease of 5.7 per cent in payroll total. In car building and repairing there was a gain of 15.8 per cent in number of employees in 67 establishments and a gain of 20.6 per cent in amount of payroll.

Compared with a year ago there has been a gain, all told, of 55.1 per cent in number of men employed, and an increase of 72.3 per cent in total payroll. This connotes a gain of 11.1 per cent in contents of the average pay envelope, which has advanced from $53.36 to $59.29.

Wages per half-month per man in automobile plants, which are exceptionally busy, are 22.3 per cent over those prevailing in steel plants. In fact, 162,111 automobile workers received nearly $1,800,000 more in the half month than did 164,731 steel workers.

Compared with August, per capita earnings increased in 21 industries and decreased in 21. Iron and steel led the increases with an advance of 9.6 per cent.

Details are shown in the table.

Period	Number of Establishments	Number of Men	Half-Month Payroll	Average Pay Envelope
Iron and Steel				
Aug., 1922..	126	167,837	$8,235,114	$49.07
Sept., 1922..	126	164,731	8,858,008	53.74
Sept., 1921..	109	107,758	4,122,567	38.26
*Automobiles**				
Aug., 1922..	97	161,356	11,295,841	70.02
Sept., 1922..	97	162,111	10,651,541	65.71
Sept., 1921..	47	103,439	7,040,183	68.06
Car Building and Repairing				
Aug., 1922..	67	46,763	2,554,081	54.62
Sept., 1922..	67	54,148	3,079,649	56.87
Sept., 1921..	53	34,499	1,946,339	56.42
Metal Workers (the three groups above)				
Aug., 1922..	290	375,956	22,085,036	58.74
Sept., 1922..	290	380,990	22,589,198	59.29
Sept., 1921..	209	245,696	13,109,089	53.36

*Payroll figures are reported as "weekly"; they have been made "half-monthly" by multiplying by 2 1/6.

Decline in Automobile Production

Figures received by the Department of Commerce through the Bureau of the Census show a marked seasonal decrease in the production of both passenger automobiles and trucks in September. The total production of passenger cars in September was 186,562, compared with 249,225 in August, while truck production in September amounted to only 18,843, as against 24,200 in August. The September production is the lowest since last March, but is considerably above the figures for September, 1921, when the total production was reported as 144,669 passenger cars and 13,648 trucks.

No successor will be elected to fill the vacancy caused by the death of Edgar B. Tyler, vice-president of the Mississippi Valley Structural Steel Co., on Sept. 27. He had been secretary, treasurer and general manager of the Decatur Bridge & Iron Co., of which he was one of the founders, but when that concern and the Christopher & Simpson Iron Co. were merged into the Mississippi Valley Structural Steel Co., Carl R. Dick became secretary; R. B. Wood, general manager, and Earl C. Brown, treasurer; Mr. Tyler being relieved of active duties.

Internal Combustion Engines for Power*

For Steel Plant and Similar Service Both Gas Engines and Diesel Engines Are Favored—Comparison of Costs with Steam Costs

BY D. M. PETTY†

INTERNAL combustion engines which will be considered in this paper are the 4-cylinder, 4-cycle double acting gas engine and the 4, 6 or 8-cylinder, 2-cycle Diesel oil engine. The discussion in general will not go into thermo-dynamic theory to any great extent, but will rather cover a general description of some of the mechanical features as well as the operation of the two types of engines, together with some analysis of first cost and cost of operation.

The Gas Engine

The gas engine which forms the basis for this discussion is rated 4000-kw. output of generator, running at 88.3 r.p.m. The floor space occupied is 68 ft. long and 37 ft. 6 in. wide; two cylinders are in tandem and each tandem pair connected to one end of the crank shaft. The distance between center lines of cylinders is 27 ft. 8 in. The shaft carries a heavy cast steel flywheel made in two parts, the diameter of which is 28 ft. and weight 130 tons. The cylinders are 47 in. diameter. The pistons, of 60-in. stroke, are made of cast steel.

In this particular size the cylinder is usually made in two pieces; however, in this as well as in similar smaller sizes, one-piece cylinders have been found entirely satisfactory. In power cylinders of this size steel rather than cast iron is employed because, in order to maintain the same factor of safety, the wall of the cast iron cylinder must be much thicker than if cast steel be used—of a thickness so great that it cannot transmit the requisite heat per unit of surface. The consequent difference in temperature between inner and outer surfaces of wall induces heat fatigue and consequent cracks when engines are steadily operated at full load. A cast iron cylinder which thus cracks cannot be repaired by welding. A cast steel cylinder seldom cracks and, if it does, can be electrically welded without difficulty. We have steel cylinders that have operated continuously 13 years and are still perfectly good.

The piston rod is 15 in. in diameter and is hollow, making a convenient opening through which the cooling water is carried to the piston. The crank shaft is a one-piece forging and the crank disk and crank pin are cast steel and made in one piece. The crossheads are also cast steel; the inlet and exhaust valves are one-piece forgings. Many of these parts are frequently made of cast iron but in the steel business cast steel is favored, for obvious reasons, and since this engine is built by a steel company, cast iron is replaced by cast steel for a great many parts.

Automatic Control

The speed of this engine is controlled by a spring weighted governor which operates an oil relay. This relay provides ample power for moving the valves, no matter whether they are clean or dirty, and is an important item in the satisfactory operation of any engine used in the generation of power.

An automatic gas pressure regulator located just ahead of the inlet valves maintains a constant gas pressure of 2 in. at the inlet valve. The air mixture is adjustable, but is maintained constant throughout any range of load from zero to maximum unless adjusted by hand, the power output of the engine being governed by throttling the mixture of gas and air rather than by adjusting its richness. The maximum pressure in the cylinder after explosion is 275 lb. per sq. in.

Gas is ignited at the proper time by three spark plugs which operate on the make-and-break principle, 110 volts being used and a current of about 0.75 ampere. This current is limited by the resistance of the winding on an iron core solenoid which gives a long inductive arc, a small incandescent lamp connected in series with the coil serving to indicate the condition of the spark plugs.

An engine such as has just been described can be bought to-day, f.o.b. cars Bethlehem, for $230,000, making the cost of the engine $57.50 per kw. Table I shows the installed cost per kw. of a gas engine power plant made up of three or more 4000-kw. units as described above:

Table I.—Installed Cost Per Kw. Capacity of a Gas Engine Power Station in 4000-Kw. Units

	Cost per Kw..	
Building, modern construction, brick and steel, tile floors, and crane, including exhaust tunnel and stacks	$7.50 to	$15.00
Foundations for engines, including excavation at $15 per cu. yd.	4.50 to	9.00
Engines, including all piping painting ready to run	60.00 to	75.00
Gas cleaning apparatus	6.00 to	8.00
Generators, switchboard, exciters, oil switches for 6600 volts	13.00 to	20.00
Miscellaneous expenses	10.00 to	15.00
Total	$101.00 to	$142.00
Average cost per kw		$122.00

The subject of gas engines should not be passed without calling attention to at least one of the points for future improvements in net operating efficiency, namely, the utilization of the heat contained in the exhaust gases. Reclaiming this energy is somewhat similar to the application of condensers to the steam turbine. This field is merely scratched to-day in a few plants where feed water for boilers is heated in a small way. The water enters the piston rod at about 100 deg. Fahr. and comes out at 130 deg. Fahr., passing to the feed water heater, where it is raised to 170 deg. Fahr. Much greater economies may be obtained by placing a large boiler or water heater so that the exhaust gases may pass through it on its way to the stack.

One great possibility lies in the heating of water which may in turn be circulated in nearby buildings and used for heating purposes. In Germany steam boilers have been used, one showing 2.2 lb. steam for each kwhr. generated by the engine. Large boilers will, of course, produce more steam. It has been conservatively estimated that the total efficiency of the gas engine may be increased easily 30 per cent by the use of exhaust gas boilers. The reason such boilers have not come into more general use is that the efficiency of the gas engine is now high and the cost of coal not sufficiently high to induce the development of this line of apparatus.

In the simplified cross section of a power house made up of such units, attention should be called to the fact that the floor line of the building is somewhat above the ground level, which permits good ventilation in the cellar and provides ample daylight lighting through suitable windows. It should also be noted that the engine floor is served by a crane, whereas the space

*Abstract of a paper presented at the sixteenth annual convention, Association of Iron and Steel Engineers, Cleveland.

†Electrical engineer, Bethlehem Steel Co., South Bethlehem, Pa.

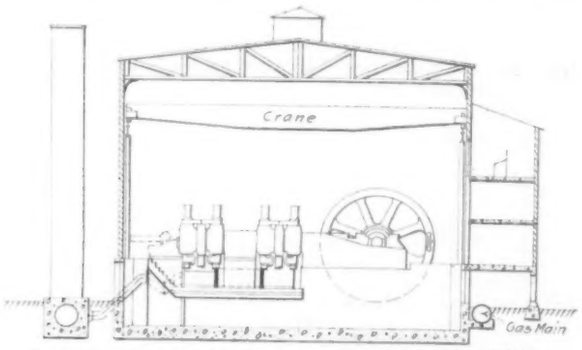
provided for the switchboard and oil switches is in the nature of a leanto on one side of the building.

Operation of Gas Engines

Table II shows the operating cost of a gas engine power plant made up of six 3000-kw. units and one 4000-kw. unit.

In the matter of operating costs, one of the principal items in the past has been the renewal of worn steel parts, such as pistons, cylinders, piston rods, etc. This item has been materially reduced by the careful application of electric welding. Formerly when the grooves of the piston became worn to such an extent as to cause excessive leakage by the piston ring all that could be done was to remachine them and put in oversized rings. This, of course, could not be carried on indefinitely on account of cutting away the metal. To-day the worn places are filled up by electric welding and machined out so that the life of a steel piston is almost infinite. A cast iron piston cannot be thus welded.

At times cracks develop in cylinder walls, especially in the vicinity of the exhaust ports, which formerly



Cross Section of a Modern Gas Engine Station Fitted with Crane Runway and Monitor Roof

would have necessitated the scrapping of the cylinder. To-day these cracks are welded and seldom open up again; in fact, discarded cylinders have been reclaimed by this process to such an extent in one plant that four extra cylinders which were on order have been canceled. It would seem, therefore, that with the proper application of electric welding a gas engine that is built of steel should never wear out and would be replaced only because of obsolescence.

Diesel Oil Engine

The Diesel oil engine which will be used as the basis of this discussion is a 2700-kw., 8-cylinder, 2-cycle, single acting vertical engine operating at 115 r.p.m.

The cylinder is 26 in. in diameter and the engine is built in sections so that it can be supplied as a 4, 6 or 8-cylinder engine and all of the like parts for each cylinder are interchangeable. The pistons are cast steel while the cylinder is cast iron. The Scavenger air inlet valve is in the center of the cylinder head, which has the inherent advantage of cleaning out all of the burnt gases with the exhaust so that the compression stroke has a full supply of fresh air to compress at each revolution. With this construction, the Scavenger air supplied is always somewhat greater in volume than the maximum capacity of the cylinder.

A 6-cylinder engine of this type is now in operation in a ship carrying ore from Chile to Baltimore and New York. The fuel economy, ease of operation and absence of serious failures has considerably exceeded the expectations of the designers, and from all tests which have been carried out the indications are that this type of Diesel oil engine will not only have a wide application in marine service, but will also make a place for itself on land in the generation of power. An 8-cylinder engine such as described above can be bought to-day, f.o.b. cars Bethlehem, for $260,000.

Operation of Diesel Oil Engines for Power Purposes

While no cost figures are now available taken under operating conditions, tests which have been made bring out forcibly some of the possibilities in the Diesel oil engine. Fuel economy tests on this engine show that under average conditions one kwhr. can be produced with 0.630 lb. of 21 deg. Beaumé fuel oil, which oil contains 19,100 B.t.u. per lb. This is equal to 0.438 of a lb. per brake hp. Since 2545 B.t.u. equal 1 hp., the thermal efficiency at the crank shaft then is:

$$\frac{2545 \times 100}{438 \times 1910} = 30.42 \text{ per cent}$$

Assuming the generator efficiency as 93 per cent, the overall efficiency of such a power unit at the switchboard would be: $30.42 \times 0.93 = 28.37$ per cent.

In the matter of speed regulation, an 8-cylinder, 2-cycle Diesel oil engine is superior to the twin tandem compound reciprocating steam engine which would have the same power impulses per revolution, and while we cannot expect it to be equal to that of the steam turbine, it is very close to it. In this connection it is interesting to note that for marine work no flywheel is used in connection with even a 6-cylinder engine and the engine is reversible. Of course, for power generation a flywheel would be used, although much lighter than is the case with a gas engine.

Comparison of Internal Combustion Engines with Steam Engines for Power Station Work

One great weakness of any steam power station is its standby losses. By this is meant in plainest terms the coal that must be burned under the boilers to keep up steam pressure when all of the power generating apparatus is shut down. If it were possible to avoid burning this coal, great savings could be effected in practically all power stations. This particular point has been forcibly brought to attention in the matter of selling power over week-ends and holidays to the power company from whom we normally buy a small percentage of our power.

The operating superintendent of the power company states that it is real economy for him to buy power, provided he did not have to bank his fires, but could burn them entirely out, as under certain conditions it

Table II

	Cost per 1000 Kwhr.
Fuel—1,443,288,000 cu. ft. Average B.t.u. value 94 per cu. ft. at 0.0094 per 1000 cu. ft.	$1.58
Labor, including switchboard operators, engineers, oilers, superintendents, etc.	0.30
Repairs, including renewals, tools, miscellaneous supplies and labor in repairs	0.33
Water for cooling—oil, waste and packing, including cooling pond expenses	0.21
Gas cleaning, including water, labor, repairs and power	0.37
Total operating cost	$2.79
Heating feed water with exhaust gases (installed on 4 engines only) credit	0.33
Net operating cost	$2.46

requires almost as much coal to keep his fires banked over a light load period, such as Saturday afternoon, Saturday night, Sunday and Sunday night, as would be burned if he were running a portion of his plant. Therefore, he has seen the wisdom of buying power which is generated in our gas engine power station over such periods. We all feel that each power engineer has a moral obligation to coming generations in the matter of conservation of our fuel reserve. Therefore the power engineer is not only serving his best interests, but also the best interests of future generations, in taking into consideration standby losses.

The annual report of the Boston Elevated Railroad Co. for the year ending Dec. 31, 1921, shows the burning of 2.174 lb. of coal for each kwhr. produced in the various plants for the year 1921. This was bituminous coal having an average heat value for the year of 14,600 B.t.u. per lb. The yearly thermal efficiency of the combined power stations would be:

$$\frac{2545 \times 100}{2.174 \times 14{,}600} = 8.02 \text{ per cent}$$

Assuming a generator efficiency of 95 per cent, the

overall efficiency at the switchboard evidently then would be:

$$8.02 \times 0.95 = 7.62 \text{ per cent}$$

This annual report also shows that this coal cost $7.71 per gross ton. We have then:

$$2.174 \times \frac{\$7.71}{2240} = 0.76\text{c. per kwhr.}$$

which represents the fuel cost per kwhr. in such a station.

It is safe to assume that under full load, in a power station such as those operated by the Boston Elevated Railroad Co., a kwhr. can be generated by burning 1.425 lb. of coal. We then have:

$$1.425 \times \frac{\$7.71}{2240} = 0.499\text{c.},$$

which is the fuel cost per kwhr. under full load conditions on such a system. The difference between 0.76c. and 0.5c. or 0.26c. or 50 per cent of full load cost, represents the increased cost of each kwhr. generated due to the standby losses and the operation of various stations at less than full load.

One great advantage of internal combustion engines, either 4-cycle gas engines or 2-cycle Diesel oil engines, is the fact that when the engine is shut down there is absolutely no standby loss—the gas is shut off or the oil is shut off. In the case of oil, that which might have been burned to make up standby losses remains in the storage tank to be used when power is needed. Therefore, we can with full assurance know that so far as fuel costs are concerned the average economy of our internal combustion engine is also the annual economy of the station made up of such engines.

We may, therefore, derive the annual cost of power when generated by Diesel oil engines as:

$$0.63 \text{ lb. of oil per kwhr.} \times \frac{\$0.05 \text{ the cost per gallon of 21 Beaumé oil}}{7.72 \text{ lb. per gallon of 21 Beaumé oil}} = 0.4018\text{c.},$$

fuel cost per kwhr. generated on Diesel oil engines. These figures show that the Diesel oil engine should be given serious consideration when planning power units to serve for standby power or to serve as peak load absorbers for a gas engine power station.

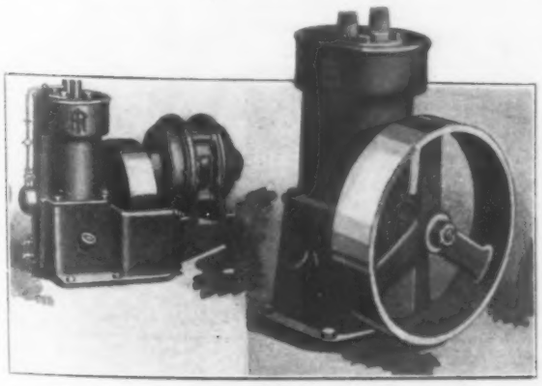
In previous papers on the subject of power generation in steel plants, the writer has pointed out the economy of using gas engines for all loads between 100 per cent and 50 per cent load factor, and suggested that steam turbines either located in a steel plant or in a central station should be used for absorbing the low load factor portion of the steel plant load. It is now evident that a third prime mover should be added to the list for this character of service, namely, the Diesel oil engine.

New Line of Small Air Compressors

The Ingersoll-Rand Co., 11 Broadway, New York, has announced a new line of small vertical belt driven air compressors, known as type Fifteen. In addition to the plain belt drive design each size is built as a self-contained electric motor outfit, driven through pinion and internal gears, or by employing the short belt drive arrangement. The compressing end and electric motor of both gear and short belt drive units are furnished mounted on a common sub-base, so that they in no way depend upon the foundation for correct alinement.

Several noteworthy features of construction have been incorporated, of which the "constant-level" lubrication system is regarded as the most important. Others include the constant speed unloader for plain belt drive machines; the centrifugal unloader for start and stop control machines; and the increased size of the water reservoir cooling pot.

The constant-level system of lubrication maintains a constant-level of oil. The base of the compressor forms an oil reservoir. Pet cocks determine the maximum and minimum amount of oil in the reservoir. Above this reservoir and directly underneath the connecting rod is a constant-level pan. Oil is pumped from the reservoir into this constant-level pan through a pump. A projecting stem on the connecting rod dips into the pan and distributes the desired quantity of oil for proper lubrication.



Motor-Driven and Belt-Driven Compressors

The constant speed unloader controls the unloading of the compressor by automatically opening the inlet valve when the receiver pressure rises above that at which the unloader is set to operate. When the receiver pressure has fallen a predetermined amount, the unloader automatically releases the inlet valve and allows the compressor to return to work and thus build up the receiver pressure again.

The centrifugal unloader allows the compressor to start under "no load" such as is essential when automatic start and stop control is used, and permits the electric driving motor to come up to full speed before the load is thrown on automatically. This unloader accomplishes its purpose by holding the inlet valve open until the motor has reached full speed.

Naval Laboratory Delayed

WASHINGTON, Oct. 24.—Work on the buildings constituting the naval experimental laboratory at Bellevue in the District of Columbia has been practically completed and equipment is being installed. But operations, except to a limited extent, cannot begin until Congress has appropriated the necessary funds. The small amount of work that may be started, will be done by special allotments from naval bureaus directly concerned in the development of experiments. Estimates required to conduct the work had been submitted, but were disapproved by the sub-committee of the Senate Committee on Naval Affairs. They will be included in the next budget in the hope of more favorable action. The laboratory was built at a cost of $1,500,000, appropriated by Congress. The idea of its construction grew out of the Naval Consulting Board of 24 leading engineers of the country, which was created shortly before the United States entered the war and of which Thomas A. Edison was chairman. Many inventions and new processes were suggested to the board and the latter urged the establishment of a naval research laboratory.

Work in contemplation at the laboratory includes metallurgical problems, and the research proposed will deal largely with these problems as well as those relating to radio. No chemical work of consequence is expected to be done at the laboratory, inasmuch as this is considered to be done better by private interests.

The Rex Typewriter Corporation, Fond du Lac, Wis., which resumed production Oct. 1 following an intermission to perfect new designs, reports foreign orders increasing in a most gratifying manner. Miller, Drake & Co., of London, cabled Oct. 14 asking the monthly shipment be increased from 100 to 150 machines. Pietro Castelli of Brussels has ordered 200 for November shipment.

Machine for Cutting Irregular Shapes

A. C. Campbell, Inc., Waterbury, Conn., has recently placed on the market a so-called nibbling machine. This machine was exhibited at the Machine Tool Exhibition at Yale University and mentioned in the Sept. 28 issue of THE IRON AGE, in which that exhibition was reported.

It will be seen that the machine consists of a C type frame similar to that of the ordinary punching machine. The overarm of this frame carries a rapidly reciprocating punch of small size which operates in a female die in the lower part of the frame. This punch is of special construction, in that a small stop pin at its extreme end governs the amount of feed. The work to be cut may be sheet iron, celluloid or any other material which is not too soft to be properly cut in such a manner and is fed into the machine against the feed pin. As the punch reciprocates small particles of the material are punched out, thereby producing the cut. The material is fed to the machine, or rather guided by the operator, following a design which may be laid out on the work or shown by a template placed on top of the work. The design of the punch and die holders permits easy removal, insertion or adjustment. A point of economy is made in the fact that the punches are made double-ended so that when one end becomes worn it may

At Left—Campbell Nibbling Machine

At Right — Scope of Work Cut by the Nibbling Machine

be reversed and the other end used. Punches are made of special alloy steel, are properly tempered for the work and ground to size.

This machine was designed to take the place of the ordinary type of circle shear which leaves a burr, whereas this machine leaves the material flat. It is also intended for a great variety of work which, in the past, has been produced by drilling consecutive holes along the edge of the layout, later to be filed. The machine will handle material up to and including $\frac{3}{16}$ in. The average cutting speed is 18 in. per minute. Adjustments for different gages of metal can readily be made and the machine is also equipped with a circle cutting attachment to take circles up to 28 in. in diameter.

The machine is adaptable to a large variety of uses, such as making gages or templates, stripper plates, designs in ornamental iron work, etc. Illustration herewith shows a number of designs which can readily be cut on the machine and will give an idea of its scope.

A study of the action of steam on coke, with regard to the reduction in sulphur content of the coke, is being made at the Pittsburgh experiment station of the Bureau of Mines by A. R. Powell, physical organic chemist, and S. H. Thompson, research fellow of the Carnegie Institute of Technology.

The New Home Sewing Machine Co., Orange, Mass., has voluntarily increased wages in the sewing machine departments. The increase varies, according to the nature of the work, but averages approximately 10 per cent.

Synthetic Cast Iron on the Pacific Coast

As is well known, pig iron is not produced on the Pacific Coast at the present time in sufficient quantities to meet the demand for iron of such grades as are required for foundry purposes. As a result, foundry iron is costly, due to high freight rates on eastern iron that is brought in and to the high cost of coke suitable for use in the cupola. On the other hand, considerable steel scrap is to be had, and, for that reason, attention has been recently given by the members of the electrometallurgical section of the northwest station of the Bureau of Mines at Seattle, to the problem of determining the best conditions for the production of cast iron by melting scrap steel in the electric furnace. These conditions were established by numerous experiments conducted in a laboratory furnace holding 300 lb. of metal.

Later on these conditions were applied in a local foundry with excellent results. Low-grade miscellaneous steel scrap was melted and carburized in a 3000-lb., direct-arc, 3-phase electric furnace and the resultant metal discharged into the pouring ladle and then into the molds for the miscellaneous gray iron castings which made up the normal output of the foundry. The carbon and silicon content of the product was under control, at all times, and the furnace operator had no difficulty in producing the grade of iron required. Satisfactory castings were made with the normal consumption of power and electrodes.

More Activity in Rolling Mill Equipment

The business of the Morgan Construction Co., Worcester, Mass., has improved to such a degree that it is running at full capacity with a single shift. Con-

tracts for rolling mills that were ordered held up at the beginning of the depression are now being carried forward and several of them have been completed, including a billet mill and a merchant mill for India. A number of American contracts are among those which would have been in operation long ago had it not been for the depression and consequent requests by purchasers to defer deliveries. In addition some rolling mill contracts have been booked in the last few months. The company is filling many orders for wire-making machinery, which accounts in considerable measure for the present activities of the Worcester plant. There are now close to 400 men on the payroll, while early in the year the shops were not at all busy.

FERROMANGANESE SUPPLIES

Output Decreasing Slowly—Importations Heavy—Available Supplies Large—Spiegeleisen Output Light

THE manganese-iron alloy output of American furnaces thus far this year has been as erratic as that of steel, due to the various strikes. The peak in ferromanganese was reached in May despite the coal strike but there has been a gradual falling off since, although the September output of 10,681 tons was considerably higher than that of the first two months of the year. The spiegeleisen production was higher in July and August at the height of the strikes than at any other time this year. The low point was 1230 tons in January, with only 2095 tons in March.

Difficulty in obtaining coke has interfered sharply with the regular merchant producers of ferromanganese and the same cause has had some effect on the output of spiegeleisen. The following table gives the production of ferromanganese and spiegeleisen thus far this year compared with previous years:

Ferromanganese and Spiegeleisen Output of the United States, in Gross Tons

	Ferromanganese	Spiegeleisen	Total	Average per Month
April, 1922	14,998	4,211	19,209	.....
May	20,334	4,902	15,432	.....
June	18,273	4,817	23,090	.....
July	18,873	7,176	26,049	.....
August	11,402	7,925	19,327	.....
September	10,681	4,235	14,916	.....
Average per month:				
First quarter	6,951	2,752	.....	9,703
Second quarter	17,868	4,643	.....	22,511
Third quarter	13,652	6,445	.....	20,097
Total, 1921	98,439	56,139	154,578	12,881
Total, 1920	282,681	103,448	386,129	32,177
Total, 1919	179,029	65,391	244,470	20,732
Total, 1918	345,306	249,002	594,308	49,525
Total, 1913	119,495	126,081	245,576	20,464

Judged by the third quarter output of 13,652 tons per month, the present production of ferromanganese and spiegeleisen is considerably heavier than that in 1921, but much below that of 1920.

Available Supplies

The available supplies of ferromanganese thus far this year and previous years, as obtained from an analysis of the output, imports and exports have been as follows:

Ferromanganese Output, Imports and Exports, and Available Supplies in Gross Tons

	Output	Imports	Exports	Available Supplies
April, 1922	14,998	2,380	241	17,137
May	20,334	5,213	41	25,506
June	18,273	13,525	55	31,743
July	18,873	25,841	179	44,535
August	11,402	15,959	76	27,285
Aver. per mo., 1st quarter	6,951	2,053	130	8,874
Aver. per mo., 2d quarter	17,868	7,039	112	24,795
Average per month, 1921	8,203	755	57	8,901
Average per month, 1920	23,557	4,941	288	28,210
Average per month, 1919	14,923	2,752	255	17,420
Average per month, 1918	28,775	2,264	298	30,741
Average per month, 1917	21,486	3,703	*776	25,413
Average per month, 1916	17,365	7,577	...	.....
Average per month, 1915	12,021	4,605	...	.....
Average per month, 1913	9,958	10,672	...	.....
Average per month, 1911	6,207	6,688	...	12,895
5-year average (1910-14) per month	8,280	8,399	...	.....

*First half only.

Due to heavy importations of British ferromanganese, the available supplies have decidedly increased. They ranged from 27,285 tons to 44,535 tons for June, July and August with the monthly average for the second quarter at 24,795 tons.

The feature of the record for recent months has been the large receipts of imported alloy. For June, July and August the average has been 18,441 tons per month or far in excess of the movement in 1913 of 10,672 tons per month when about half of the American consumption came from abroad. The recent importations exceed any previous record and have been due to efforts to anticipate the duty which went into effect Sept. 21.

Manganese Ore Imports

Imports of manganese ore have been increasing almost each month this year, due also to a duty, and in contrast to a decrease in ferromanganese production. In the first quarter of this year these were only 10,609 tons per month but in July and August they had increased to over 62,000 tons per month. Imports thus far this year, compared with other years, have been as follows:

Manganese Ore Imports into the United States in Gross Tons

	Total	Average per Month
April, 1922	25,559	.....
May	46,517	.....
June	44,329	.....
July	62,518	.....
August	62,121	.....
First quarter	31,828	10,609
Second quarter	116,405	38,801
Total, 1921	401,354	33,446
Total, 1920	606,937	50,578
Total, 1919	332,344	27,779
Total, 1918	491,303	40,942
Total, 1917	629,972	52,498
Total, 1916	576,324	48,027
Total, 1915	320,784	26,732
Total, 1913	345,084	28,858

For the first eight months this year, ore importations have been 34,109 tons per month which compares with 33,446 tons per month in 1921 and over 50,500 tons per month in 1920. In 1913 they were only 28,858 tons per month.

British Supplies of Manganese Ore

Importations of manganese ore into Great Britain have been moderately increasing this year but are far below those of pre-war and war years. The following table gives the record:

British Imports of Manganese Ore

	Total	Average per Month
April, 1922	8,712	.....
May	31,518	.....
June	18,798	.....
July	27,415	.....
August	29,644	.....
First quarter	21,831	7,277
Second quarter	59,028	19,676
Total, 1921	172,856	14,405
Total, 1920	452,613	37,718
Total, 1919	265,800	22,150
Total, 1918	365,606	30,467
Total, 1917	331,264	27,605
Total, 1916	439,509	36,625
Total, 1915	377,324	31,443
Total, 1914	479,435	39,953
Total, 1913	601,177	50,098

For the first eight months of this year British ore importations have been 17,239 tons per month which is only a little higher than the 1921 movement and considerably under the record of any other year from 1913 to 1920 inclusive.

Supplies and Needs in 1922

Not long after the United States entered the war it was officially estimated that the monthly needs of the steel industry were 28,000 tons of ferromanganese. This was based on the use of 80 per cent alloy and a steel output of about 43,000,000 tons. Assuming the 1922 steel production to be 32,000,000 tons, based on the data to date of the American Iron and Steel Institute and that 74 per cent of this is open-hearth steel with two-fifths of the Bessemer output absorbing spiegeleisen as high carbon steel, the estimated amount of 80 per cent ferromanganese necessary this year at 17 lb. per ton of steel is 217,600 tons. Adding to this the 10,000 tons estimated as usually needed in the iron foundry business, the total 1922 needs become 227,600 tons. That this will actually be less is probable because the total steel production will probably fall below 30,000,000 tons.

To meet this theoretical ferromanganese demand of 227,600 tons, there has already been produced 170,828 tons to Oct. 1 with 49,078 tons imported to Sept. 1, or a total of 219,906 tons. Production for the then remaining months of this year will probably total 30,000 tons and importations will continue heavy, part of the remaining four months at least, so that the theoretical needs of a liberally estimated steel output will be more than amply met, even if importations ceased altogether.

The Ensign-Bickford Co., Simsbury, Conn., has voluntarily increased wages of its several hundred employees 5 per cent. The plant is operating at capacity.

ROLE OF METALLURGIST

Interesting Points Developed at Meeting of Detroit Foundrymen's Association

Harry Rayner, metallurgist for Dodge Bros., Inc., addressed a largely attended meeting of the Detroit Foundrymen's Association Oct. 19 on "The Rôle of the Metallurgist in the Foundry." Mr. Rayner urged the closest possible co-operation with the foundry's sources of raw material supply, suggesting that through the medium of the purchasing department it is possible not only to arrange for the regular supplies of coke, pig iron, sand and other bulk materials of standard grades, but also to secure such materials of unusual analyses as may be occasionally required for particular purposes. He cited particularly the possibility of locating special casts of pig iron, such as high manganese, for which the producer may have no immediate outlet and which can readily be secured, provided the metallurgist is constantly in touch with furnace operations at the plant supplying him, thus largely eliminating the use of more expensive alloys.

Referring to scrap, Mr. Rayner emphasized the absolute necessity of uniformity in the material charged into the cupola, pointing out that much can be done toward this end by a constant and careful inspection of purchased scrap at the point of origin before it is loaded for shipment. If this is not possible, he argued, the foundry will find it more profitable to use only its own return scrap. The metallurgist must have absolute control of the cupola, the charging and melting operations and, with a proper degree of tact, should follow the castings through the machine shop as well. He insisted that the foundry could not be run from the laboratory, but that the metallurgist, to realize the full possibilities of his position, must be in close personal touch daily with all operations from the selection of raw materials through the machining of the castings.

Several interesting points were developed in the discussion which followed Mr. Rayner's paper. Regarding pouring temperatures, it was agreed that the hotter the iron the harder the thin sections will show on the Brinell test. This condition is reversed for heavy sections, and machine shop complaints are most numerous on cylinders cast with dull iron. It was also stated that castings which carry a thin skin of extreme hardness can sometimes be corrected by weathering in storage, as they will rust down to a point where they will machine readily.

The Detroit association also discussed the possibility of co-operating with the engineering department of the University of Michigan in making an exhaustive study of some problems of importance to the foundry industry. Suggestions included the subject of core oils, the chilling of cylinder bores and the securing of a uniform standard of foundry coke.

Meeting of Electric Steel Founders' Research Group

The chief executives and the operating officials of the companies comprising the Electric Steel Founders' Research Group recently held a three-day meeting at Wernersville, Pa., at which exhaustive progress reports were presented on researches being conducted by the organization into annealing, core practice, facing practice, furnace practice, and the elimination of slag from castings. It is stated that there has been gratifying progress in each group investigation and that the improved volume of business in the industry at present affords better opportunity for the prosecution of certain researches than when operations were curtailed during 1921.

The group members report that the standardization of practices has recently been extended to cover methods of chemical analysis.

The group consists of the following companies: Electric Steel Co., Chicago; Fort Pitt Steel Casting Co., McKeesport, Pa.; Lebanon Steel Foundry, Lebanon, Pa.; Michigan Steel Casting Co., Detroit, and Sivyer Steel Casting Co., Milwaukee. The group began active work a little more than two years ago. Details of the working plan adopted by the group were published a short time ago.

Quad City Foundrymen Meet

The second meeting of the Quad City Foundrymen's Association was held in Rock Island, Ill., Oct. 16, with an attendance of 90. Dr. Richard Moldenke, Watchung, N. J., gave an address on general foundry practice. He started in with a brief history of the foundry industry from its inception and followed through up to the present day practice both in this country and in Europe, before and after the world war. He held the attention of the members for an hour and a half, after which time he answered questions up until ten o'clock.

The association had a representative attendance from 27 gray iron, malleable, steel, brass and aluminum foundries. It seems that they had representatives from all departments of their local industries as follows: Managers, 16; general superintendents, 6; foundry foremen and foundry superintendents, 25; foundry engineers, 3; chemists, 5; pattern makers, 1; production managers, accountants and clerks, 6; purchasing agents and welfare men, 8; non-members of the association, 20.

The foundrymen of the section pledged themselves to hold the third Monday in each month open for a monthly meeting. A. E. Hageboeck is president, John Ploehn, vice-president, and R. L. Van Alstyne, secretary and treasurer of the association.

Engineering Research

Much information regarding the division of engineering of the National Research Council is given in a 36-page booklet 6 x 9 in. just issued by the council in co-operation with the Engineering Foundation, 29 West Thirty-ninth Street, New York. Approximately 80 societies are included in the membership of the council, its division of engineering, one of thirteen in all, being located in the Engineering Societies Building to facilitate co-operation with those societies. The division plans programs for projects brought before it and aids in organizing and carrying out the plans. It co-ordinates the work of societies, industries, universities, governmental bureaus and individuals along research lines. Among the fields which have been investigated are those relating to pyrometry, fatigue of metals, steel ingots, highways, molding sands, marine piling, electrical core losses and insulation, heat transmission, hardness of metals, deoxidizing for steel and welding of all varieties.

Iron Mining Discussed

A meeting of the New England Street Railway Club, held Thursday evening, Oct. 19, at the Copley-Plaza Hotel, Boston, attended by about 100, was devoted to a discussion of the mining of iron ore and its conversion into commercial products consumed by street railway companies.

Frank B. Walker, superintendent maintenance of way, Eastern Massachusetts Street Railway Co., read a paper on the mining of iron in the Mesabi iron range. Illustrations accompanied his talk. F. A. Weymouth, sales metallurgist, Bethlehem Steel Corporation, read a paper on modern practice in rolling special steel T and girder rails.

In the analytical work on blast furnace hearth gases, being performed by the U. S. Bureau of Mines, the composition of the gases in the tuyere plane has been determined at two furnaces in the Pittsburgh district. One, a furnace making ferromanganese, showed conditions practically identical with Southern practice on basic or pig iron. The other, making basic iron, showed penetration of oxygen to a further distance than obtained in the Southern furnaces. Arrangements have been made with a blast furnace operation at Youngstown, Ohio, to obtain samples at other planes up the bosh. It is hoped that this work may bring forth some valuable information.

CONTENTS

October 26, 1922

From Ore to Nails in Minnesota Plant 1057
Steel Corporation Adds Rod Mill and Wire Plant to Its Duluth Works—Labor-Saving Devices and Safety Measures Are Features

Decision Favors Steel Corporation Roads 1065
Interstate Commerce Commission Examiner Finds the Rates for Hauling Minnesota Ore Are Justified—Favors Reduction on Old Range Rates

National Problems at Implement Meeting 1067
Gap Between Farmers' Selling and Buying Prices Widening—Foreign Trade Prospects Poor—Compulsory Arbitration of Industrial Disputes Urged

Internal Combustion Engines for Power 1073
For Steel Plant and Similar Service Both Gas Engines and Diesel Engines Are Favored—Comparison of Costs with Steam Costs

Study of Economics As a Need in Industry 1086
Value to Management Discussed at Industrial Engineers' Convention—Selecting Employees, Labor Relations, Cost Reducing and Material Handling Among Subjects

Press Safety Guard of Positive Type.... 1064
Increase in Rates Not Justified..... 1064
Decreased Activity of Ohio Foundries... 1064
Chairman Schwab Confident..... 1066
French Imports of Machinery and Tools. 1068
For Saving Floor Space in Production Grinding 1069
Cromwell Steel Co. Plant and Equipment to Be Sold at Auction..... 1069
Shipments to Foreign Countries..... 1069
Motor Operated Snap Switch for Automatic Applications 1070
Donner Steel Co. in Alloy Field..... 1070
Crystallization of Galvanized Malleable Iron Castings 1070
Combination Grinding and Buffing Machine 1070
Canadian Rail Order..... 1070
Cast Iron Pipe Making..... 1071
Nickelized Zinc in Ribbon Form..... 1071
What Compressed Air Does in Industry.. 1071
September Refractories Statistics..... 1071
Serious Labor Problem..... 1072
More Metal Workers and Higher Wages. 1072
Decline in Automobile Production..... 1072
New Line of Small Air Compressors.... 1075
Naval Laboratory Delayed..... 1075
Machine for Cutting Irregular Shapes.. 1076
Synthetic Cast Iron on the Pacific Coast. 1076
More Activity in Rolling Mill Equipment 1076
Ferromanganese Supplies 1077
Role of Metallurgist..... 1078
Meeting of Electric Steel Founders' Research Group 1078
Quad City Foundrymen Meet..... 1078
Engineering Research 1078
Iron Mining Discussed by New England Railway Club 1078
Editorials 1080
Automobile Steel Less Seasonal—Prices and Progress—Manganese and the Tariff—Getting a Full Day's Work—A More Efficient Cupola—Building Costs in England—The Government's Hand in Prices
Business Forecasts 1083
Van Keuren Lapped Steel Surface Plates 1084
Independents Adopt New Pipe Prices... 1084
Universal Saw Bench with Tilting Arbor 1084
Large Coal Output..... 1085
Preparing to Use Iron Ore of Utah... 1085
Limestone Rates Protested..... 1085
Last Sale of Surplus Material..... 1085
French Market Quieter..... 1090
Mechanical Engineers' Annual Meeting in December 1090
Export Market Dull..... 1091
Steel Industry in Soviet Russia..... 1091
Railroad Equipment Buying..... 1106
Fabricated Steel Business..... 1106
J. A. Fay & Egan Co. Buys Plant..... 1107
German Prices Advance Again..... 1109
British Iron and Steel Market..... 1110
Improvement at Lackawanna Plant..... 1110
Book Reviews 1111
New Trade Publications..... 1111
Industrial Finance 1120, 1121

Iron and Steel Markets 1092
Comparison of Prices 1093
Prices Finished Iron and Steel, f. o. b. Pittsburgh..... 1105
Non-Ferrous Metal Market 1107
Personal Notes 1108
Obituary Notes 1109
Machinery Markets and News of the Works..... 1112
New York Jobbers' Prices 1122

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President* PRINTED IN U. S. A. George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Charles G. Phillips *Vice-Pres.* A. C. Pearson, *Treas.* F. J. Frank, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 410 Unity Building. Philadelphia: 1420-1422 Widener Building. Cleveland: Guardian Building Detroit: 317 West Fort St. Cincinnati: Mercantile Library Bldg. Buffalo: 881 Ellicott Square. Washington: 26 Jackson Place, N. W. San Francisco: 320 Market St. London, Eng.: 11 Haymarket, S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Automobile Steel Less Seasonal

It is a matter of comment that the demand for steel from the automotive industry this year, for the first time, did not decline materially with the wane of summer. Some manufacturers doing a large business with that industry find specifications for tonnages for the last half of the year are greater than those for the first half, and it is the belief as well as the hope of the steel producers that this important outlet is passing out of the seasonal class. That sales of those forms of steel finding large, if not principal, use in the manufacture of automobiles, trucks and tractors should have increased in recent months is explained in part by the drift of pleasure car design toward the closed or all-the-year-round car, with its larger use of steel. Further, it required no unusual prophetic gift to visualize as far back as early summer the present railroad transportation conditions and the incident increase in the use of motor trucks to get steel from the mill to the consumer.

Those best informed believe the new development in automobile steel to be a permanent one and speak of it as a natural evolution. The automotive industry has reached a point where changes of design from year to year are becoming less important. The degree of standardization that has been attained gives greater latitude in the matter of advance purchases of steel. It also permits the maintenance of motor car production at a higher rate in the period of light demand than was possible when the struggle to get out something new in a pleasure car was almost as intense as the competition for business; indeed, when new design was the chief sales argument. The present capacity for the production of automobile steels is ample, provided the requirements are spread over a reasonable period, but to meet the requirements of a year in six or seven months would require the maintenance of a certain amount of steel making capacity which necessarily would be idle in what have been considered off-season months.

The demands of the automotive industry, though probably less rather than more than 8 per cent of the country's output of steel, have been so insistent at times as to affect the entire structure of steel prices. This was notably the case in the early part of 1920 and to a less degree was felt this year. When their cars were selling well and they were compelled to make close connections with steel works, the automobile manufacturers have not let the price stand in the way. Steel in the ingot moves toward those finishing outlets in which the prices are best, not infrequently at the expense of other requirements. If the mills get the chance to make up the steel when motor car buying is lightest, there will be no pinch in the supply when the call for cars is greatest. That there was not a scarcity of tin plate this year—and the demand for food containers has been extremely large—was due to the fact that the container manufacturers put in their specifications early and had tin plate in abundance when the demand came for cans. The automotive industry does well to take a leaf from the book of the can makers.

Prices and Progress

An important item in the economic alinement of affairs in the past half dozen years is the part that inefficiency plays in the making of commodity prices. If this item be overlooked a misleading conclusion may be reached as to "the business situation" at any given time. Before the war we did not feel, perhaps, that the American people were doing their work and conducting their business altogether efficiently, but in the retrospect, and in the light of much that we have seen lately, we must conclude that these things went on rather well in that period.

That the market price of a commodity rose indicated, as a rule, that there was a particularly heavy demand for it, and the demand was symptomatic of the community having progressed so as to be able to buy more of the goods. There was some debate as to whether rising prices caused prosperity or prosperity caused rising prices, but the argument was conducted chiefly by doctrinaires. The practical business man was not interested, for he felt confident that the two went together, and that seemed enough for him.

The situation now is quite different. In the high prices of the past few years the factor of inefficiency has been important. A very fair and

comprehensive index is the debits to individual accounts at banks outside New York. Taking the volume of debits in 1919 as 100, 1920 stood at 118 and 1921 at 91. Taking the Bureau of Labor's index number of commodities at wholesale and using 1919 as a basis, we have: 1919, 100; 1920, 115; 1921, 73. Inasmuch as a very considerable part of the bank debits represent payment for merchandise, it is evident that a large amount of business was done in 1921. Judged by prices and by the amount of "unemployment" one would rate 1921 as a year in which very little work was done. There were not so many men drawing wages and salaries as in 1920, but those who were being paid were doing more work than they did in 1920.

When Connellsville coke sold above $10 a ton, recently, the high price was no sign that there was prosperity and progress. It was a sign of great inefficiency. Little coke was being made. It has been explained lately that the cost of producing Connellsville coke is high because the operators, besides employing coal miners and coke oven workers, must employ numerous guards. That does not represent efficient production of coke. The pig iron producer should not regard the condition as favorable, even though it enables him to secure a higher price for his pig iron than would be obtainable if coke were being produced at low cost and sold at corresponding prices; nor can the foundryman or steel maker find evidence of "prosperity" in the high price of pig iron. The advancement of the country is measured not by prices nor by the volume of money turnover, but by the commodities and service the people of the country receive.

Manganese and the Tariff

Importations of ferromanganese in recent months have been on a larger scale than ever. Not even in 1913, when British producers furnished about 50 per cent of the total American consumption, were the receipts so large. In June, July and August, importations averaged 18,441 tons per month; in 1913 they were 10,672 tons per month. Steel output in 1913 was about at the rate of to-day. The heavy shipments preceding Sept. 21, as is well known, were due to the effort to anticipate the new duty of 1⅞ cents per pound of contained manganese. It is interesting to note, in connection with the figures bearing on manganese supply given elsewhere, that even with the country's steel production this year more than 60 per cent greater than in 1921, there is already in sight a supply of ferromanganese well in excess of any theoretical need. Production and importations to date exceed the demands of the 32,000,000-ton steel output now indicated even should domestic output and importations cease for the rest of the year.

It will take time, therefore, to demonstrate how much of the new duty British producers of ferromanganese will need to absorb in order to hold a share of the domestic trade; also what part of the "protection" given them by the new tariff domestic producers may need to give up in order to shut out the foreign product. There is also the unsettled question of the extent to which steel companies which for years have been buyers of ferromanganese will become makers of their own supply. Further, in view of the large imports of manganese ores before the new duty of 1 cent per pound of contained manganese went into effect, some time will elapse before domestic producers of such ores, in whose interest the whole manganese tariff schedule was framed primarily, will have the chance to justify or to discredit the large promises made for them to the tariff-framers at Washington.

Getting a Full Day's Work

Much has been written comparing present-day labor efficiency and that to which we were accustomed before the war. Most of the writers have given their own impressions and many of them have shown such bias that their opinions have been discounted accordingly. Only when definite figures have been derived from careful comparative studies are the results likely to be of real value.

One such study, made by the steamship lines of the Southern Pacific Co. in connection with unloading cargoes from three steamers of the company at New Orleans, dealt with fifteen consecutive trips in 1915, five for each steamer, and fifteen consecutive trips, five for each steamer, in the winter of 1919-1920. The figures showed that the tonnage handled per thousand man-hours was more than 39 per cent greater in 1915 than in the later period. The steamers were an identical three in each case; the unloading facilities had not been changed; the character of cargo was the same; the tonnage handled in the fifteen trips in one case was within 1¾ per cent of the total handled in the other fifteen trips. To a large extent, the very men involved in unloading were the same in the one case as in the other. The hours per day were slightly fewer in 1920 than in 1915, so the element of greater fatigue could not be adduced. Hence the falling off must be ascribed almost wholly to the difference in willingness to work between the two periods.

An interesting sidelight on this question of willingness to work, which ties back into the whole problem of labor union domination, now reaches us from England. A joint investigating committee of the Engineering and National Employers' Federation, the Shipbuilding Employers' Federation and the Negotiating Committee of the Trades Unions has issued a report which, due to the composition of the committee, avoids expressing any opinion. Evidence in this report bears out in a striking way the justness of the demand of employers that labor be paid according to its productivity, rather than on the basis of the time put in on a given job.

Riveters engaged in building a warship, and working on time, drove 176 rivets per squad per week. When payment by results was adopted, the number of rivets driven in a week per squad of riveters increased to 722—a gain of no less than 310 per cent.

In another case, when the workers were paid so much per week, the frames of a vessel were set at the rate of 54 pairs in 14 weeks. This works out at slightly less than four pairs of frames set

each week. Under piece work rates, with the same workers, 80 pairs of frames were set in 5½ weeks, or nearly 15 pairs per week. The increase in production per gang per week in this case works out at 277 per cent.

Mechanics fitting watertight sliding shutters took 490 hours when on time work; the same job was done in 150 hours when payment was by result; the gain was 227 per cent.

Not so striking, but still showing more than double the output per thousand man-hours, was the case of two ships built from identically the same plans, one of which, built on time rates, took 2601 hours to complete, while on piece work rates the sister ship, with the same number of men working, was completed in 1151 hours. The gain here was 126 per cent.

None of the above makes pleasant reading for union labor leaders, yet the farmer is not paid according to the number of hours he puts in in his field; the steel worker is to a very large extent on the tonnage basis of payment; salesmen in many lines are paid a commission or some form of bonus, sometimes in addition to a monthly stipend. Such a method of payment by results is not only the fairest that can be devised, when properly safeguarded, but it is the one which, while making satisfactory return to both capital and labor employed, tends to insure the buyer of the product against inordinate prices.

A More Efficient Cupola

That the cupola, generally regarded as an efficient melting medium, is capable of decided improvement is demonstrated in an article in THE IRON AGE of Oct. 19 describing the Schuermann type, a recent German invention. If the claims made as the result of fairly extensive trials can be generally substantiated, this new cupola is well worthy of the attention of American iron foundrymen. In the language of the author of the original German description: "No such fundamental change in cupola practice has been seen for the last century." This statement comes from the foundryman who made the trial tests, not the inventor.

The Schuermann cupola involves the use of a pre-heated blast under pressure, one object sought being a shortening of the time of melting. The test runs showed not only a shorter operating period but low coke consumption. Of equal importance was a reduction in the sulphur content of the iron by 20 to 30 per cent.

The advantage of employing such a device in coping with high cost fuel and high sulphur scrap is manifest. Such conditions obtain in this country to-day and probably in Germany, and the electric furnace has been advocated and used to correct them. But there are many cases where only a cupola is available. In 1908 at the Toronto convention of American foundrymen a somewhat similar suggestion was discussed. It was exemplified in the Baillot cupola, devised by a Belgian engineer, which made a novel use of hot waste gases, provision being made for returning them to the tuyere area. This cupola was described in THE IRON AGE of Nov. 19, 1908. It appears to have acquired no foothold in this country.

Another improvement in foundry melting was described in THE IRON AGE, Aug. 31, in an article dealing with centrifugal iron castings. The Hurst cupola, developed in Great Britain, involves a special mechanical charging device and an oil-fired receiver or fore-hearth which supplies hot metal of regular and uniform composition, a particular essential in the centrifugal casting process.

It is to be noted that increased interest in better cupola performance is shown at the same time that efforts for the improvement of regenerative furnace practice are yielding remarkable results. The past year has seen great strides both in the United States and Great Britain in the increase of open-hearth furnace outputs at steel works through more rapid and more complete combustion. There are not the same possibilities of improvement in the operation of the ancient shaft furnace of the foundry, but it is not unreasonable, in view of the recent developments referred to above, to expect a better approach to theoretical cupola efficiency than the average foundryman has so long been satisfied to attain.

Building Costs in England

There seems to be a difference of opinion as to the status of present building costs in England, and their relation to unemployment. One authority has stated that the present excess above prewar costs is between 60 and 70 per cent. But the National Federation of House Builders places it at 125 per cent and takes the view that any revival in the building trades is bound to lead to a very serious shortage of labor, according to the London *Ironmonger*. This condition would prevent a reduction in the rate of wages. Fear of a shortage of labor reads queerly, in view of the fact that at the end of June the number of unemployed receiving relief or unemployment doles in England and Wales was 1,769,400 workers, or one out of every 21 in the entire population of men, women and children. And on Sept. 18 the number of wholly unemployed persons registered at the exchanges in Great Britain was 1,307,200. From these figures it would seem that any revival in any industry in Great Britain should be exceedingly welcome to all concerned.

The Government's Hand in Prices

The *Engineering and Mining Journal-Press* refers with enthusiasm to a plan it has had in operation since May, under which its market quotations on copper, lead and zinc have been made "as a further precaution and safeguard, with the co-operation of those federal bureaus in Washington which are specially interested in the mining industries"—the Bureau of Mines, the United States Geological Survey and the Bureau of Foreign and Domestic Commerce. Each week the quotations are "fixed by a committee consisting of the market editors of *Engineering and Mining Journal-Press* and the representative of the federal bureaus," who is H. S. Milliken, chief of the division of War Minerals Supply of the Bureau of Mines.

This is certainly a novel Government activity and decidedly a new departure in metal market reporting. The statement that the committee referred to above "fixes" market quotations is probably not to be taken with all the implications of the word. Nevertheless, those whom years of experience in market reporting have confirmed in the notion that their work is rather that of registering accurately prices established by actual sales cannot but ask why a Government representative should be given so important a place in the "fixing" of quotations on important metals. The independence of the men whose reports of market conditions and quotations of prices have become authoritative in great industries is an honorable tradition of business journalism. Why the Government check? And especially why the Government hand, after all the war-time machinery of price-fixing has been done away with and when both at Washington and throughout the country the clear call is being sounded to take and keep the Government out of business?

BUYERS HESITATE

Prices Softening in Youngstown District—Labor Shortage Felt

YOUNGSTOWN, Oct. 24.—Steel prices are softening following substantially reduced costs of coal and coke, affecting pig iron production costs. As shipments are improving, urgency on the part of consumers for material is not so apparent. In sheets, Valley makers are rapidly reducing their unfilled obligations. Some of the smaller, non-integrated interests are not more than a week behind on their running orders. Business is being placed in lots ranging from 100 to 250 and 500 tons.

Basic pig iron has declined to $30 in the Valleys, and little forward business is being done. It is expected that settling of coke prices may establish a $28 iron market for the first quarter of 1923. Steel works interests operating their own blast furnaces are largely consuming their output, with the exception of the Brier Hill Steel Co., which is making shipments regularly against a contract with a middle interest, which involved a purchase by the maker of scrap at a figure above the market at the time.

Semi-Finished Material

Sheet bars, open-hearth and Bessemer, have stabilized at $40 for the final quarter, and price adjustments with interests covered by contract have been made on this basis. Such sheet rollers as the Newton Steel Co., Falcon Steel Co., Falcon Tin Plate Co., Ashtabula Steel Co. and the Mahoning Valley Steel Co. are covered on their semi-finished requirements over the remainder of the year. There is little demand for slabs and billets, which are taking the same quotation as sheet bars. With softer iron prices likely to apply on first quarter business, such interests are looking for a recession in sheet bar prices.

Sheet Conditions Easier

This same feeling is reflected along the line in finished products and particularly in sheets. Any interest in the Valley would take on tonnage to-day on the basis of 3.50c. for No. 28 gage black, with a proportionate differential for galvanized. It is reported that some mills are even willing to shade this price on attractive tonnages, and it is not unlikely that the 3.35c. quotation of the American Sheet & Tin Plate Co. will apply on some tonnages entered by independents over the next month. This is particularly true of mills which are over-supplied with galvanized grades and are anxious to balance their books.

Furthermore, some of the smaller makers, such as the Ashtabula Steel Co., are in position to offer prompt tonnages at the prevailing market, which is weakening the stand of mills that have been holding out for premiums. Further weakening in sheet prices is looked for, in view of the tendencies of the market downward.

Scrap Weakening

Dealers are still endeavoring to bolster the scrap market, which shows, however, unmistakable signs of weakening. Offerings by the railroads are increasing and deliveries are somewhat better. Steel makers are buying warily and are doing nothing to disturb the market in the way of bidding against each other. On heavy melting grades, $22 is representative of the market and $20 to $20.50 on compressed sheet steel.

Shortage of common labor is felt by the more important producers, as production expands, and employment agencies throughout this section are being solicited for workmen.

BUSINESS FORECASTS

Methods of Looking Into Future Considered at Meeting at Harvard University

That a growing number of industries are considering and applying forecasts of business conditions, issued from various institutions, and that the basis of such forecasts in many instances are gradually becoming more fundamental, was demonstrated at a management meeting held Thursday, Oct. 19, in the new lecture hall, Harvard University, Cambridge, Mass. The meeting was initiated by the management section, American Society of Mechanical Engineers, and by the New England section, Taylor Society, and was in conjunction with similar meetings held simultaneously throughout the United States.

An Inside Story

Charles J. Bullock, chairman Harvard University Committee on Economic Research, with the aid of many charts, gave an extremely interesting inside story of how data are collected and applied in forecasting business conditions. The purpose of his address was to convince business interests that such forecasts are founded on carefully compiled statistics, which are corrected as collected, and assembled in groups of relationship. There is no guesswork or haphazard taking for granted, and special stress was put on the fact that the personal attitude of bankers, business interests, etc., are eliminated. Mr. Bullock said:

"We shut ourselves up in our offices with our figures. The results we obtain are nothing more or less than mathematical problems worked out on the corrected statistics covering the period of years beginning with 1903."

Mr. Bullock stated it was hoped statistics extending as far back as the Civil War would shortly be corrected and in such form as to give a basis for further calculation. By the charts presented, the University's economic research department has satisfied itself that cycles and long train movements follow given courses over a period of years. Many of those present at the evening session were of the opinion that earlier records will show no deviation in proven general cycle and train movements.

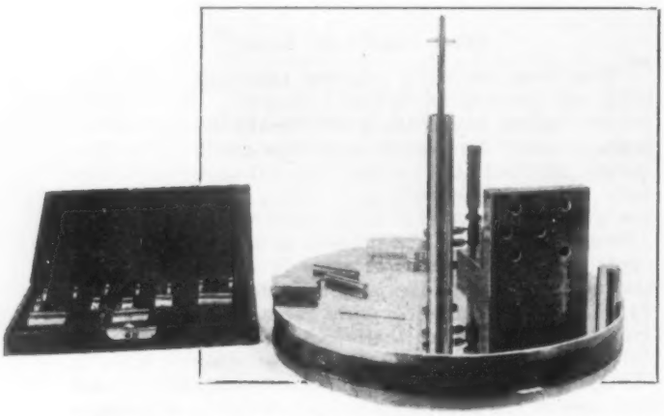
C. H. Jones, president Commonwealth Shoe & Leather Co., Boston, gave a talk on the practical application of cyclical forecasts to manufacturing management. The application in his case was just previous to and since the business depression of 1920. Mr. Jones admitted that some doubt existed in his mind prior to the depression as to the soundness of the Harvard economic research forecasts, but these in time, coupled with the rise in the rediscount rate of the Federal Reserve Bank, strengthened his belief.

Van Keuren Lapped Steel Surface Plates

The Van Keuren Co., Allston, Boston, Mass., has added to its line of measuring tools various sizes of hardened steel lapped precision surface plates. In the accompanying illustration the character of the highly finished lapped surface of the 10-in. diameter surface plate may be noted in the reflections of the tools and work placed on the plate.

The lapped steel surface plates are said to be of a degree of precision in advance of the hand-scraped cast iron surface plates, and to be free from the numerous hills and valleys of hand scraping. They are tested for planeness during manufacture by light waves.

For such work as the inspection of small parts by passing them between a dial gage and a surface plate, for sine bar set-ups and for the many set-ups where



Lapped Steel Surface Plate. The mirror-like surface is evident from the reflections of the tools and work

precision gage blocks are used, the lapped precision surfaces are claimed to have many advantages over the common hand-scraped surfaces. Gage blocks may be wrung directly on the lapped steel surface and the hardened steel plate wears indefinitely longer than the usual cast iron. The surface plates are available in 5, 8 and 10-in. diameters, and are furnished with two handles which screw into the edge of the plate. A suitable wooden box is provided to protect the plate.

Independents Adopt New Pipe Prices

YOUNGSTOWN, Oct. 24.—The Youngstown Sheet & Tube Co. and the Republic Iron & Steel Co. have followed the action of the National Tube Co. in advancing pipe prices from $4 to $5 per ton. Makers report a sustained demand for standard merchant pipe in buttweld sizes, and some improvement in the inquiry for the larger sizes. Producers had not benefited from the previous advance to any extent, owing to the fact that their books contained substantial orders booked at lower prices, which they have been working off.

Consequently, pipe prices have not followed the advances in other finished lines, insofar as they have applied to actual transactions. District mills have been balancing their stocks during the period of car shortage, retarding shipments.

High Operating Rates in the Mahoning Valley

YOUNGSTOWN, Oct. 24.—High operating rates are being maintained by Mahoning Valley iron and steel properties. Of 47 blast furnaces in the Mahoning and Shenango Valleys, 30 are now pouring. Steel making is fully at 90 per cent, with all three Bessemer converters in the Mahoning Valley blowing and 60 to 66 open hearth furnaces charged.

Sheet mills were scheduled at 97 per cent at the beginning of the week, while 15 of 17 tube mills are rolling. The plate mill of the Republic Iron & Steel Co., inactive except for irregular rollings, is in commission. Six of nine independent bar mills are rolling, and all 17 bar units operated by the Carnegie Steel Co.

Due to shortage of men, 20 of the 88 puddling furnaces at the Girard plant of the A. M. Byers Co. are idle. Its bar mill is operating two 8-hr. turns and its plate mill one 8-hr. shift.

Non-integrated sheet rollers are maintaining their usual schedules.

Republic Plans Considered

Meeting in Youngstown last week, directors of the Republic Iron & Steel Co. discussed a program of expansion and rehabilitation at the Youngstown properties. Engineering surveys relating to modernizing the Brown-Bonnell department and the Bessemer plant have been made. Methods of financing the improvements were also discussed. John A. Topping, chairman of the board, presided.

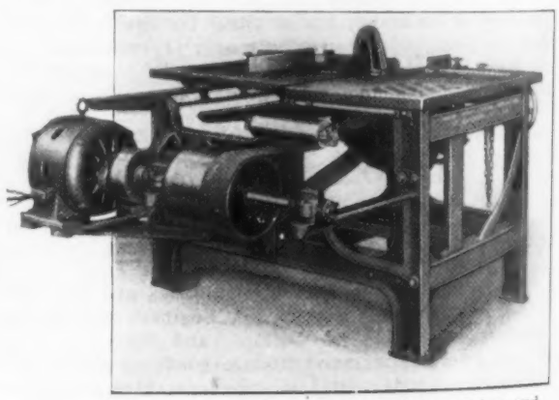
Universal Saw Bench with Tilting Arbor

A universal saw bench with tilting arbor and sliding table, intended to do the work of the usual machine with stationary or movable table and in addition to saw accurately any angle, bevel or miter, or two angles at once, has been placed on the market by the Hooker Mfg. Corporation, St. Johnsbury, Vt.

The machine illustrated is the motor-driven unit and has the miter gage over the saw. The saw is raised and lowered by means of a hand wheel, which adapts the machine for grooving and rabbeting. By means of a hand wheel on the front of the machine, the saw can be changed from perpendicular to any angle up to 45 deg. The frame is constructed rigidly and to permit of access to all parts. The cross girt on the front is offset to permit the operator to work close up to the saw.

The left-hand table is movable sidewise and adjusted to the saw, and being hinged at the back can be raised and tipped. The right-hand table runs on rolls fitted to the track, carrying the work to the saw, and sidewise adjustment permits the use of a dado head. The yoke carrying the saw arbor is guided in a circular groove. It is raised or lowered in dovetailed ways by an elevating screw operated by a handwheel. The yoke can be set at any height or angle and the saw can be raised or lowered when in a tilted position without disturbing its setting.

The saw arbor is of steel, 1 13/16 in. in diameter, the diameter where the saw is mounted being 1 in.



Universal Saw Bench with Tilting Arbor and Sliding Table, Showing Arrangement for Motor Drive and Miter Gage Over Saw

It runs in babbited bearings, grooved for end thrust and all oil holes have dust caps. A ball-thrust bearing, provided between the box next the saw collar and the saw collar itself, is a feature. Ball-bearing boxes can also be provided for the spindle. A 3-hp. 40-deg. motor is used, being mounted as shown. Cut-off gages can be fastened to the table at any angle, one rip gage serving as plain or adjustable to 90 deg. in either direction. A miter gage and plain stop gages are included.

The capacity is for saws of 6 to 10 in. diameter, the latter size cutting stock 6½ in. thick. The speed of the saw arbor is 3600 r.p.m. The floor space occupied is 72 x 58 in., and the weight of the motor-driven machine, 1350 lb. net.

LARGE COAL OUTPUT

Production for Third Week in October Exceeds Ten Million Tons

WASHINGTON, Oct. 24.—Production of bituminous coal in the third week of October, according to complete returns to the Geological Survey, showed an increase to about 10,200,000 tons. The number of cars loaded on Monday, Oct. 16, as reported by the railroads, was 41,201, establishing a new record for this year. The daily average for the first four days of last week was 32,803 cars, while the daily average for the same period for the preceding week was 31,501 cars. The daily average for October last year was 31,045 cars. Production of anthracite coal during the third week of October is estimated at 2.000,000 tons. Transportation remains the limiting factor in the current rate of coal production. Since the first of September no other causes have appreciably restricted the rate of output.

According to reports from the Northwestern Coal Dock Operators' Association the stocks of soft coal at Duluth, Superior, Ashland and Washburn increased from 120.384 net tons on Sept. 1 to 1,034,520 tons on Oct. 1. In comparison with the year preceding, the present reserve appears very small. In 1921 the movement up the lakes was heavy and accumulated on the docks, but in 1922 shipments away from the docks during the period of the miners' strike nearly stripped them of the heavy tonnage carried over from the season before. Practically all the coal on hand represents shipments received during September.

Record Coal Output Predicted

UNIONTOWN, PA., Oct. 22.—Rapid gains in the firing up of new ovens and increased output of coal will set a new record for production for the year when reports are received for this week. This forecast is an apparent certainty because of the production for the week ending Oct. 14 when production in the Connellsville bituminous region as 140,710 tons, only 9000 tons less than the production for the week ending April 1, when the "sympathetic strike" became effective in the Connellsville region. This was an increase, too, of 14,360 tons over the production for the preceding week.

Furnace coke producers in the region are daily adding to their output. During the week just closed, W. J. Railey, Inc., started up four of its six coke making plants in the region, the other two having resumed operations. The Railey company now has 28 per cent of its ovens in blast.

Washington Coal & Coke Co. is preparing to resume its coke production.

There was an improvement in the transportation service during the week on all lines except the Baltimore & Ohio, which is placing less than 20 per cent of car supply to the operations in the Connellsville region. Representations to the Baltimore & Ohio by the new Fayette-Greene Coal Producers' Association brought replies that extraordinary efforts were being made to increase the car placements.

Ovens in blast during the week ending Oct. 14 were 12,330 as compared with 4420 for the same week in 1921.

Coke prices were softer during the week, as was coal.

Preparing to Use Iron Ore of Utah

WASHINGTON, Oct. 23.—Plans for far Western steel interests to manufacture products from native iron ore in that section of the United States are reflected in an authorization just granted by the Interstate Commerce Commission to the Los Angeles & Salt Lake Railroad to construct a branch line. The certificate issued authorizes the carrier to build a branch 32 miles long from a point on the main line near Lund, Utah, to Cedar City, Utah, at a cost of $798,301, exclusive of equipment. This road is to open a tract of 840,000 acres. Around Iron Springs, 22 miles from Lund are iron ore beds which are estimated to contain 400,000,000 tons.

The report of the commission says:

"Two large steel companies contemplate opening mines and shipping ore from this district as soon as the branch line is built. One of these companies proposes to construct blast furnaces for reducing the ore, which will probably be located on Utah Lake. The development of the ore deposits is necessarily contingent upon the construction of the proposed branch. The applicant estimates that initial shipments of iron ore will total 1250 tons a day and that the output will be substantially increased as the district develops."

Limestone Rates Protested

WASHINGTON, Oct. 23.—The Jones & Laughlin Steel Co., Pittsburgh, has filed a brief with the Interstate Commerce Commission, protesting that the proposal of the Baltimore & Ohio Railroad to reduce the rate on limestone from the Martinsburg, W. Va., district to the Mahoning and Shenango valleys from $2.14 to $1.76 per ton without making a corresponding reduction to the Beaver district of Pennsylvania, will unduly prefer the former and prejudice the latter. The brief also states that the proposal of the Western Maryland Railroad to reduce the limestone rates from western Maryland points to Aliquippa, Woodlawn, Beaver Falls, and Ellwood City, Pa., to $1.51 has been justified. The originating points are the Cavetown and Thomasville groups in western Maryland and the present rate is $1.64. The Baltimore & Ohio and the Pennsylvania railroads have filed protests against the establishing of the $1.51 rate, but have made no protest against other proposed rates.

Last Sale of Surplus Material

WASHINGTON, Oct. 24.—The last of the auction sales conducted by the United States Shipping Board, through the Emergency Fleet Corporation, of surplus material, will be held at Sparrows Point, Md., Nov. 22. The auction will be conducted by the M. Fox & Sons Co., Baltimore.

A large quantity of valves, varying in size from 1-in. to 20-in., are to be included in this sale. They were manufactured by Crane & Co. and other manufacturers of standard valves. It is estimated that there are 50 tons of brass valves and 150 tons of the iron valves; many of the iron valves are brass fitted.

There are four Yarrow tube boilers of the Express type, each having a heating surface of approximately 4900 sq. ft. and built for a pressure of 465 lb. per sq. in.

Valley Shipments Increase

YOUNGSTOWN, Oct. 24.—While shortage of mill type gondolas for movement of steel products is still holding back shipments, there has been an appreciable betterment, within the past week, in the supply of box cars for this district. In consequence, the movement of such products as sheets, tin plate and nails, as well as fabricated steel requiring box cars, has been substantially accelerated. Fully 75 per cent of the accumulation in such finished steel materials, which clogged mill aisleways and warehouses, has been moved. This movement has been especially marked to Western points, as box cars have been sent into this territory in large numbers from Eastern centers, and loaded for Western destination. Trainloads of such cars have moved into the Valleys at times, to help relieve the congestion.

The Birmingham plant of the United States Cast Iron Pipe & Foundry Co., is getting into production of 6 to 12 in. pipe with the De Lavaud centrifugal process. Moving pictures of the process will be shown at a meeting of the New England Water Works Association at Boston, Nov. 14.

Study of Economics as a Need in Industry

Value to Management Discussed at Industrial Engineers Convention—Selecting Employees, Labor Relations, Cost Reducing and Material Handling Among Subjects

THE economics of industry, the fundamentals necessary to maintain maximum production with a minimum of effort, waste and cost, formed the major subject of the ninth national convention of the Society of Industrial Engineers, held in New York, Oct. 18, 19 and 20.

The attitude of industrial executives to-day is strikingly similar to that of executives two generations ago toward science and engineering, said Prof. Joseph W. Roe, president of the Society in his address on the relation of economics to industry, given at the opening session. Engineer, chemist and metallurgist are now as necessary a part of all large-scale industry as the accountant. We are at another joining of the ways, he said. To-day, with the increasing scale of production, it is becoming evident that social wastes are no longer tolerable. A knowledge of sound economics and sociology is clearly a help in the reduction of large scale wastes which may be subtle and, though very real, not obvious. Society and industry are so bound together that neither can permanently prosper at the expense of the other, he continued; whatever vitally affects one, affects the other. This means, he said, that industrial leaders in their own interest must consider economics or the social aspects of their business as they learned to include physical and chemical science 50 years ago.

To-day the economist is very much in the field of realities, actually measuring the forces at work in society and their effects, collecting and studying masses of facts covering wide areas and long periods of time, as none but the most exceptional manager could do, Dr. Roe pointed out. He is bound to see some things the manager misses, he continued, and some forces which the manager may "feel" but does not recognize or understand. As an example of these, the advantages and disadvantages of specialization and division of labor, the function of the middleman and of speculation, over-production, and the relation between value and price, were cited. Permanent business success can come only through conformity to sound economic principles, he emphasized.

Instances of how directly economics bears on the work of the industrial executive were given, among these being the consideration as to the economic size of a manufacturing enterprise and the work of the economist in the field of labor relations. In connection with the latter, it was pointed out that economists have made studies covering nominal and real wages in all the major industries and in all countries, back to the Middle Ages, the trend of prices and the history of periodic fluctuations and their causes.

Few executives closely concerned with immediate labor problems realize that many of the acute conditions they have to meet are recurrent, following closely the broad fluctuations of business prosperity, said Professor Roe. As an example of their aid it was pointed out that economic studies show clearly that during every period of rising prices, preceding a boom, labor is aggressive, wages rise, and unions increase in number strength and activity. The boom bursts, he said, and with the depression which follows, there is inevitably a series of defensive strikes, in the main unsuccessful, to retain the high wages of the boom, with a weakening of unionism. Then there has always followed a period of social experiments turning to political nostrums, etc., until with the rise of the next period of prosperity, the round is started all over again. The industrial history of the United States since 1830 was outlined to illustrate the recurrent cycles.

How to Bring Economics Into Useful Relationship

More general reading on economics, industrial history and labor relations by industrial executives and labor leaders were among the suggestions offered as definite and practical ways of bringing industry and economics into a close and more useful relationship. More readable books on economic and social subjects were given as a crying need, and the teaching of sound economic standards in colleges and schools, and in general placing them before a much broader public was advocated. More general utilization of the present sources of economic information and statistics and the study of conditions of an industry by its trade association were suggested. The development of a systematic study of the sources, quantities and prices of the material used in industry and means of making this information generally available was also suggested.

The many serious attempts being made to incorporate sound economic principles in the conduct of our business affairs were referred to by J. H. Pardee, president J. G. White Management Corporation, New York, in an address on the part of economics in the formation of a policy of business administration. The policy involved in placing a new product on the market was outlined, it being pointed out that the selling price cannot always be fixed in relation to the cost of production. The rate at which the public will buy "at a price" must be predicted carefully, the speaker said, and the costs of manufacture at this rate accurately determined. Misunderstanding in economic affairs, because of the lack of common units and methods of measurements, was emphasized, and the opportunity of service in placing before business men some rational standards upon which an adequate system of measurement can be founded was pointed out.

In the discussion of these papers E. F. Du Brul, general manager National Machine Tool Builders' Association, Cincinnati, stated that a different attitude toward economics since the recent depression was evident, and cited the registration of nearly 200 in a course lately introduced in a high school in Cincinnati. Mr. Du Brul also pointed out that trade associations generally are getting more and more to study the economic phases and that industrial engineers must reckon with the trade association as a very essential element in the application of economics to industry. An address of welcome was made in the opening session by Dr. Magnus W. Alexander, managing director National Industrial Conference Board, New York.

Study of Economics Gives Perspective

The economic background necessary for a business executive was discussed at an informal dinner meeting of the education group of the society. In defining economics in relation to the manager's position, Dr. Lee Galloway, Ronald Press, New York, chairman of the meeting, said that the object of economic study is the acquirement of a knowledge of laws that concern the general welfare of society. He further said that the managerial interest in this study is to provide a background of economic information whereby business enterprise may be guided and controlled in harmony with the principles conducive to the general welfare. In another place Dr. Galloway declared that "there is perhaps no sadder comment to be made on the attitude of the present-day executive than that while modern economic organization has so arranged and broadened its background as to embrace the nation and the world, the business man of to-day is trying to formulate business policies with a perspective not different from that of the ancient Greeks and Romans."

Prof. Fred D. Fairchild, department of social and political science, Yale University, emphasized the need of economic principles as a basis for practical affairs, saying that how he can grasp more of the great principles of economics and make them serve should be the

first interest of a business man. Economists, on the other hand, he said, should get into closer contact with practical affairs. The growing analyzing by business men of price and other situations was noted by Prof. R. C. McCrea, school of business, Columbia University, who stated that the tendency toward research in recent years will supply business men with a body of generalizations that will give something to the economist himself. A description of the aims and methods of his institution in training administrative engineers was outlined by Prof. E. H. Schell, department of economics, Massachusetts Institute of Technology. Prof. E. J. Kunze, recently of Pennsylvania State College, emphasized the service aim as the real objective of industry, since civilization, he said, is based on industry.

Studying Methods of Expert Worker

The "Relation of Fatigue Elimination to Other Activities" was the subject of a dinner meeting of the committee for the elimination of unnecessary fatigue in industry, Dr. Frank B. Gilbreth, Montclair, N. J., presiding. A new and simple teaching device, designed to eliminate fatigue in the transference of skill or in studying the "one best way to do work," was described and illustrated by Dr. Gilbreth. The device was called the Magster, and consisted of an inexpensive stereoscopic viewer of time and motions on moving picture photographs on paper. It is said to have been used to permit investigators and learners alike to see the "super-experts'" methods in infinite detail in a leisurely manner, permitting of maximum degree of transference of skill from the super-expert without personal contact. The device was offered to the engineering and teaching professions without restriction of patent. Dr. L. I. Harris, department of health, City of New York, Prof. K. Spooner, Polytechnic Institute, London, Dr. Uyeno, Univeristy of Tokio, Miss Nellie Swartz, department of labor, State of New York, and Dr. Stanley Kent, were other speakers at this meeting.

The method used by his company in making a financial budget was outlined by A. J. Lutterbach, controller Palmolive Co., Milwaukee, at the evening meeting, Oct. 18, of which J. Parke Channing, vice-president Miami Copper Co., was chairman. In answer to an objection that budget systems work in normal times but not in depressions, Mr. Lutterbach said that this was true to a certain extent, but pointed out that most of the years were normal. It was also brought out that although in his company the budget was made for the period of a year, in some companies a three months' period might be better.

Stimulating Creativeness in the Worker

The need of a budget for the workman was advocated by R. B. Wolf, consulting engineer, New York, in an address on "The Importance of the Elimination of Waste to the Economic Structure." Among the steps pointed out by Mr. Wolf as tending to strengthening of our economic structure were that we should recognize waste as essentially time which has passed when constructive thinking was absent. To reduce this waste to a minimum we must organize our industries so that the thinking process of the workers is stimulated. To present to the workers facts relating to their past performance, was emphasized as essential, particularly noting what they have accomplished in quantity, quality and economy. The facts of past performance must be presented in a way to enable the workers to see the possibilities of the future. Rewards should be so made as not to stimulate acquisitiveness, on the latter it being said that one of our difficulties is that we have assumed the acquisitive, rather than the creative, as the basic instinct. It is only by so doing, Mr. Wolf said, that the worker can be made to see that accomplishment is the cause, and reward the effect. The giving of productive costs to the workers was stated as one effective means of combatting some of the economic fallacies that have crept into certain radical types of organizations. The cost or economy record was advocated as the most effective means of enabling each individual in the plant to be conscious of his relationship to his fellow workmen and to the plant as a whole.

Sherman Rogers, introduced by the chairman as the "lumber jack orator," addressed the meeting on "Short Cuts to Industrial Sanity." Getting spirit into the worker is, he said, the big job in industry to-day, adding that no workingman will make 100 per cent effort until he understands the rules of the game he is working under. Mr. Rogers' talk, which was forecful and direct, may be summarized in his statement: "Mean what you say when you say it. No employer need worry about his labor if he plays fair. We must reach down into the hearts of men."

Executives and Workmen's Views on Cutting Cost

An afternoon was devoted to "Two Important Economic Factors," the first of which to be considered was "How Can We Reduce Production Costs." J. A. Faust, Waltham Watch Co., Waltham, Mass., discussed the topic from the executive's standpoint. The first consideration influencing costs, he pointed out, lies in the ability of the executive properly to conduct the three phases of his business, financing, production and sales. The fundamentals with which the executive is chiefly concerned in reducing costs, such as the reducing of inventories, decreasing turnover times in manufacture, establishing best production methods, reducing the line of products and compensating labor so as to secure the best returns, were outlined. The sales budget was pointed out as an important possibility in the reduction of expenses, the speaker saying that in this there is an interesting field open for careful study, with ample reward for the effort. That economies in manufacture are possible, due to the savings in work in process, and product made obsolete by changed sales schedules was emphasized as furnishing also the basis for intelligent purchases. A specific instance of the reduction of costs along these lines was outlined.

"If you don't give a worker every chance to use his best skill and pay him accordingly, you should not blame him if costs go up for want of a broadened use of his knowledge," said William Geiger, Keratol Co., Newark, N. J., in presenting the reduction of cost from the worker's viewpoint. That workers should be encouraged to notify foremen when tools are not in condition to do fast work, that unused skill of workers is an extravagance and that a shop with a reputation as a good place to work, which results in minimum of expensive labor turnover, were among the cost reducing factors outlined. The necessity of co-operation was emphasized, which, he said, was a willingness to go 50-50 on work and pay. The piece work plan was commended as easy to understand and practical to use if the operation is repeated. Cutting of piece rates made the worker suspicious and in that condition he cannot be a good co-operator. "Fancy plans" for wage payment did not succeed, he said, with the average worker.

Keeping Workers Contented

The second factor considered at this session was "What Keeps Workers Contented?" A plan in which Charles Cheney, Cheney Brothers, South Manchester, Conn., had faith, was the "credit rating" plan. In this the worker is put into a grade or class in which the base rate has been fixed, there being added to this rate various additional factors representing qualities which tend to render him especially valuable as an employee. These are a record for quality and quantity of production, length of service, record of attendance, versatility, etc.

In concluding the session, the chairman, M. Porosky, engineer, Holtzer-Cabot Electric Co., Boston, said that if companies spent half the money to create good will of the workers as they spend in creating the good will of customers, discussions of these subjects would not be necessary.

Selection of Employees

How to develop a more scientific method of selecting people for jobs was the subject of a sectional meeting of the industrial relations group, Earl B. Morgan, manager of employment and service, Curtis Publishing Co., Philadelphia, being chairman. He prophesied that in ten years we will look back at our methods of to-day and wonder how "we got by with them." Having an elaborate reception hall for customers and sending applicants around to the back door, to be met by a watch-

man or clerk, was incomprehensible. "Before you get to selection," he said, "you must have the stage setting right." That interviewers too frequently take a holier-than-thou attitude and seem to be looking for the 100 per cent man was emphasized as a wrong practice.

Balance of types was brought out as an important consideration in taking on help and in this connection it was pointed out that it is as necessary to analyze the executive who was to handle the new employee, his likes and dislikes as to analyze the job. Committee action, or the combined judgment of the personnel executive and the department heads, was said to be a good thing in the case of applicants for high grade jobs. The discussion also brought out that in the matter of selection too little attention is given to the possibilities of the waiting list; that it is good providing the applicants have confidence that they will be sent for in the event of an opening. To what extent the foreman should be consulted in selecting and firing help was a center of discussion. That the foreman can dismiss from his department but not from the factory was the method of some, and in the matter of selection it was stated that it being a 50-50 proposition the interviewer and the foreman should both be equally responsible. Phrenology and so-called character analysis as a yardstick of selection was suggested but did not meet with general approval.

Economic Aspect of Production

One of the notable addresses of the meeting was that of Ernest F Du Brul, general manager of the National Machine Tool Builders' Association. He discussed the "Economic Aspect of Production." He said in part:

When the engineer speaks of production he has in mind fabrication of physical goods. But, in economics, production means the creation of utility—whether of time or place or form—and presupposes adequate demand. We hear much of the necessity for increasing production. Naturally, if no goods are produced, we have no goods to supply our wants. Only when goods are plentiful can many wants be supplied; if goods are scarce some wants must go unsatisfied.

The gospel of "production and more production," while absolutely true within certain limits, must be recognized as having those limits. It is true only to the extent that production or fabrication can find a use or a profitable market for the goods. Beyond that point we simply waste effort and capital that should be devoted to producing something else that some one wants strongly enough to pay a profitable price to get it. If we take this word production to mean fabrication, regardless of market conditions, we may simply destroy wealth previously accumulated, and at one time held in the form of liquid assets.

Too many think that mere fabrication creates value. We like to think that, because we have invested our costs in goods. We therefore shall get those costs back at a profit. But we overlook the fact that the price we will get will measure the value to the buyer at the time of sale, not the cost to the producer. If we misjudge how low this value will be at the time we are ready to sell, if we do not rightly forecast the state of demand at that time and do not adjust our supply to meet it, we sell at a loss. Mere fabrication of excess goods, no matter how low the cost, cannot bring salvation unless the goods can be sold at a profit. Continued fabrication at times of glut brings ruin to the fabricator and reduces the total wealth of the community.

Then the question comes, "Who must keep all this going?" The economist designates him the entrepreneur or enterpriser. His distinctive function is to take the responsibility and the risk of all this speculative activity; to employ the auxiliaries, labor, capital, inventor, management. He is the one to render the final decision, to say "go" or "stop"; his to stand the losses from whatever cause and to reap the profits that the rest of the world envies him too much. The progress of the world in the past has been gained only because some men were willing to risk money in new and untried ventures. As it has always been, it always will be, because human nature is human and is the most permanent of all existing things. The man who risks is the only one who really initiates, who starts things going and keeps them going till he himself—or his creditors—stop them.

Without him the world would soon go back to barbarism. Yet the world envies the few conspicuous successes to whom its own progress is due. Weighing all his losses against his gains, it is the wonder of the age that men should be so optimistic as to take the business risks they do, merely in the hope that they will be Fortune's favorites and manage to escape her slings and arrows long enough to get the prize.

Every industry of consequence needs a service of its own, because demand works back and forth between interdependent industries. Therefore proper forecasting involves the study by an industry of its own conditions and their correlation with the facts of other industries. In this country we have had various destructive projects proposed by big men in business, like the Ford and Edison and Durant schemes of currency and credit. We likewise have had some notable business smash-ups, to the tune of $750,000,000 of liabilities last year. Much more was lost by those who did not smash, but were able to survive the tidal wave of deflation. The biggest and most failures were among manufacturers of various kinds, fabricators of goods. Do these failures not indicate that something is very wrong in the economics these men applied in management? Business gets into such a state because business managers start out on false premises due to incomplete knowledge of economic theory.

There is an oft quoted saying of Emerson's to the effect that, if a man produce a better mouse trap, he would have a path beaten to his door by eager purchasers, even though he lived in the depth of a wood, remote from other men. The unction with which this is so often flung out shows how a fallacious half truth takes root in peoples' minds, if some prominent man first utter it in kindergarten language. But as a business man he never finds paths beaten by buyers to a door where there never has been any advertising done, or any selling effort made. This Emersonian saying utterly neglects the important influence of marketing, with all its intricate problems of publicity, distribution, finance and its manipulation and stimulation of demand.

Because fabrication is not distinguished from production of utility of time and place as well as of form, we hear the cries, "The producer gets too little out of what the user finally pays" and "Labor produces all wealth." This emphasis on fabrication gets men into the bad habit of considering that in fabricating goods they produce value, and just by fabricating or growing something they acquire a right to demand other goods or services in return for theirs.

The usual fabrication man has another impression that many production engineers confirm in his mind, which is, "the more the output of a plant, the lower the cost and the greater the profit." Here he slips again in logic, because often the cost is higher, and even though the cost may be lower, it does not necessarily follow that the profit will be greater in all cases. But then he has another fragment of economics in mind, and retorts, "The lower the price the larger the market, and you enlarge your profit by greater volume." Yet, in fact, at times the market gets smaller when prices are falling and larger when prices are rising.

In the closing discussion, Friday afternoon, Oct. 20, one speaker brought out the value of the work of the industrial engineer by relating in some detail an experience he had had with a plant which in 1919 had found itself short of manufacturing facilities. The management had determined to double the plant, both as to buildings and machinery, in order to take care of a potential demand calling for double the production then being turned out. The industrial engineer who was called in advised the management rather to organize the present plant and equipment on a higher production basis, and to depend upon the unexpanded plant for the extra production. Ultimately this advice was followed. The production was expanded some 25 per cent, after which demand fell off, due to the coming on of the "buyer's strike," and the company had been saved an enormous expenditure for new buildings and plant, which could not have been erected in time for the demand which existed and could not have found employment when the demand fell.

Material Handling Session a Feature

A material handling session, taking for its subject "the application of economics to material handling for the purpose of reducing cost and increasing production," was a feature of the meeting. The shortage of the available human power applicable to industry, the great change in the amount of available male muscle since the war, was brought out by the chairman, R. A. Wentworth, manufacturing manager Barrett Co., New York, who pointed out that in material handling we have a new opportunity, which, he added, the material handling men are grasping.

A talk that was received with great interest was that of M. R. Dennison, superintendent of stores division of the Studebaker Corporation, on the subject of trucks and tractors. He outlined some of the accomplishments at the South Bend works of his company. The seven divisions of the plant and the crane equipment and special hoisting devices were described. Hand

labor, he said, has been eliminated except for short hauls of 2 ft., and close attention to handling of bulk materials, such as pig iron, gave a greater field of economy than others. In the descriptions of how purchased finished materials were handled he said that they had an arrangement with the supplier by which the racks in which the materials are shipped are utilized in receiving and storing the materials. All finished material taken above the first floor is handled by cranes, no elevators being used. The machine shop which is 500 x 520 ft., has an inspection bay in the center, the work moving toward the center and only two hand trucks are employed, conveyors of all types being used. Emphasis was placed on the handling of waste material, which, he pointed out, is one phase of material handling usually overlooked. At the South Bend plant a tunnel equipped with a conveyor receives the borings and turnings which are delivered to trucks. One tractor is devoted to this use, and cranes are used to place the boxes in the cars, not one man touching the waste material. "The real contributing cause of successful operation of this system was layout and planning, not only in material handling, but on all the operations," Mr. Dennison said in conclusion.

Under the title of "Overhead Conveyors" W. C. Hoover, engineer of the B. F. Goodrich Co., Akron, Ohio, outlined the system of conveyors used in making up batches in his company's plant.

A talk on portable elevators or tiering machines was given by M. W. Potts, construction engineer. One installation was a portable elevator having a power hacksaw mounted on it, the hacksaw being elevated to the storage rack and used to cut off lengths from the bar and the bar left on the rack. This arrangement was said to have saved a great deal of handling. The use of portable elevators in handling punch press dies was outlined, and in the motion pictures that followed the handling of dies from storage to the punch presses, and the handling of toteboxes at the plant of the Seng Co., Chicago, were shown. The loading of wire on cars at the works of the Interstate Iron & Steel Co., was also shown, this installation being said to have reduced the time of loading a car from 2½ to 1 hr.

The use of steel belt conveyors was described by Harry Carlson, Sandvik Steel, Inc., New York. The ease of installation, the rust resistant properties of the belt, and simplicity with which material can be discharged at any point along the conveyor without the use of expensive trippers, were among the features outlined. Mr. Carlson's talk was illustrated with lantern slides, which showed actual installation in handling a variety of materials. Details of design brought out that the speed of the steel belt varies from 135 to 300 ft. per min., the average being 200 ft. Inclines vary with the material handled and is from 1 to 4 for a smooth belt which has to be scraped off for unloading. If terminal unloading only is used slats can be attached to the belt and the inclined increased to about 1 in 2.75.

A talk on the design and use of gravity conveyors was given by W. P. Stivey, Philadelphia. Among the points brought out was that if portable gravity conveyors were made too heavy to handle, they will not be used. The necessity of putting the right machine in the right place was emphasized, illustrations of heavy units for light work being given, Mr. Stiver remarking that there are more misfits in this than in any other line of equipment. That most people do not buy gravity conveyors with rollers close enough together and buyers usually do not allow enough grade, were brought out. He also advocated the use of more boosters than usually found. His talk also covered helical chutes, the principle underlying the action of which was explained. Use of various installations of gravity conveyors for use with such chutes were given, and these included installations for round packages with the rollers of cast iron and concave.

In summarizing, Mr. Stiver gave eight principles underlying the successful installations of gravity conveyors. He said that a prospective user of this equipment should know the various types of equipment in use and available for his use and a study of the routing conditions was very necessary. No other job requires more study, he said, adding that to get the best results there should be close co-operation between the manufacturer and the engineer. That the layout for the conveyors should be considered when the buildings are being planned was emphasized, Mr. Stiver stating that they are the first thing that should be designed, the house being built around the handling of material. The making of changes with the same care that is put in the original installation was emphasized, as well as teaching the use of the equipment, especially to the foreman on the job. Regarding the maintenance, he said that a conveyor is usually nobody's pet and everyone's hobby horse, and advocated making some one person responsible for its condition.

Exhibition Features

An exhibit was held in a room close to that in which the main sessions were held, 20 companies showing various products, including material handling equipment.

The Standard Conveyor Co., North St. Paul, Minn., displayed a miniature model of a conveyor system made up of a helical chute, belt and gravity conveyors, inclined-slat conveyor and an automatic straight-lift elevator. These were assembled in one unit, which was in operation showing how boxes are raised and lowered and conveyed in industrial plants. Samples of ball bearings and different sizes of rollers and samples of pneumatic tubes, were also included. Sections of its gravity conveyor, showing patented differential curve and various pneumatic tube carriers were shown by the Lamson Co., Boston, as well as photographs of various installations of its equipment and a moving picture entitled "Multiplying Man Power." A model of an actual installation of steel belt conveyor, with all units 1/20 actual size, and combining inclined and horizontal drive in one unit was shown in operation by Sandvik Steel, Inc., 233 Broadway, New York. Specimens of steel belts were also displayed, one of which had been in use out of doors 3373 hr. and was still in good condition.

The Mercury Mfg. Co., Chicago, had a photographic exhibit, showing views of component parts of tractors and trailers, and actual operation of its trackless trains in various railroad, steamship and manufacturing plants were shown by moving pictures. A model of its portable scoop conveyor was shown in operation by the Portable Machinery Co., Passaic, N. J., photographs of the conveyor in actual use also being shown. A telescoping portable elevator, known as the Little Lifter and operating from a lamp socket, was demonstrated by the Economy Engineering Co., Chicago, and a demonstrating board, showing typical fire alarm, watchmen, and telephone systems in operation, was displayed by the Holtzer-Cabot Electric Co., Boston. Other exhibits of this company included horns, vibrating bells for signal systems, radio headsets, telephone systems and audible calling systems for shop use. A large exhibit was that of the Toledo Scale Co., Toledo, Ohio, scales of various kinds being displayed. A model showing the head mechanism of the heavy capacity scales and a model showing the construction of the platform, lever, and suspension bearing, were features of interest. The exhibit also included automatic counting scales, a long column portable scale, and a short column portable scale arranged to be elevated to different heights. A large photographic exhibit of various installations of the company's weighing and counting equipment was on view.

Industrial systems for tool checks, tool inventories, cost records, perpetual inventories, stock keeping, production control, machine control, and various types of carbon factory forms were shown by the McCaskey Register Co. The Educational Exhibition Co., Providence, displayed models and samples of various types of graphic control, including production, locating supplies, sales, etc. In industrial seating, the C. A. Cook Co., Cambridge, Mass., exhibited adjustable-back spring chairs, and the Royal Metal Mfg. Co., Chicago, its Royal-Chicago factory chair.

The production men of the Society of Automotive Engineers will hold a two days' convention, Oct. 26-27, at the General Motors Building, Detroit. Pierre S. du Pont, president General Motors Corporation, will be the guest of honor.

FRENCH MARKET QUIETER

Prices Still Firm, But Domestic Demands Slacken —Export Market on Sheets Strong

PARIS, Oct. 12.—Although the iron and steel market has lost none of its inner firmness and prices are well maintained, there is undoubtedly, since the beginning of October, a slackening of demand in the domestic market. Among the causes that have brought about this change are the end of the building season and the fact that dealers, having replenished stocks during August and September, are no longer open to new business.

August production of pig iron and steel was as follows:

	July, 1922 Metric Tons	August, 1922 Metric Tons
Pig iron	428,115	447,350
Steel	368,666	396,533

August pig iron output was made up as follows:

	Metric Tons
Pig iron for refining (fonte d'affinage)	20,435
Foundry iron	106,524
Bessemer iron	3,308
Basic iron	308,807
Special iron	8,776

The steel production for August, 378,073 metric tons of ingot and 18,460 metric tons of castings, was made up as follows:

	Metric Tons
Acid process	2,001
Basic steel	274,990
Open-hearth steel	115,508
Crucible steel	477
Electric process	3,557

From Jan. 1, to Aug. 31, 1922, France produced 3,136,482 metric tons of pig iron and 2,809,703 metric tons of steel.

Iron Ore.—The iron ore market is improving. Hope is entertained that Germany will shortly increase her imports of French ore. Although the minette from Lorraine is a much poorer grade than the Canadian ores recently purchased by Germany, it is much cheaper and Westphalian iron works are accustomed to using it on a large scale. The recent decrease of French ore transportation rates for export is expected to be of assistance. Negotiations opened a few months ago with certain consumers of the Cleveland district in Great Britain for shipment of French Lorraine ore, have just been reopened.

Pig Iron.—The August production, 447,000 metric tons, which might easily be doubled if France disposed of an adequate supply of coke, is sufficient to meet the home requirements, but insufficient to permit France to cut a real figure in export markets. There is practically no stock of foundry pig iron. However, the demand has quieted down, and the quotation of 230 fr. for chill cast foundry iron No. 3 P. L., which was made for October delivery, has not been upheld. The present price is 225 fr. A slackening of the demand for hematite iron is also to be observed. A few orders have been booked for the United States, Switzerland and Italy. Prices vary, according to district, from 280 to 300 fr. at producing works. If this price is compared with that of 320 to 325 fr. f.o.t. Dunkirk quoted for British hematite, it will be seen that the British product is out of competition for the present. Some French hematite has been sold at 310 fr., delivered Havre.

Semi-Finished Steel.—Inquiry has receded, but prices remain firm for basic steel, per metric ton at producing works in the East or in Lorraine, as follows:

	Fr.
Ingots	315
Blooms	325
Billets	350 to 355
Sheet billets	385 to 390

Beams.—The Comptoir Sidérurgique, which controls the domestic sales of beams and rails, booked, in September, orders for beams totaling about 60,000 tons, a record figure for this year. However, it is not probable that at the next meeting of the Comptoir the base price of beams will be raised beyond the present level of 475 fr. For export, the price of beams is 380 to 400 fr. (Belgian currency) f.o.b. Antwerp.

Rails.—The rail market is calm. Practically the only business being done is for light rails (not controlled by the Comptoir) at 400 fr. per ton f.o.b. producers' works, Lorraine. For export, the price of heavy rails is 410 to 420 fr. (Belgian currency) f.o.b. Antwerp.

Sheets.—The situation continues excellent. Foreign competition is almost non-existent from Great Britain, because of the high value of the pound sterling and from Belgium in consequence of a recent price increase. French works not in the Comptoir are quoting prices which closely follow those of the Comptoir. Delays of delivery on light sheets are extending and now average about three months.

Rolled Merchant Iron.—A reduction in demand is noticeable. The present average price is 445 fr. at producers' works. For export, basic shapes from Lorraine are now quoted 380 to 400 fr. (Belgian currency), f.o.b. Antwerp.

Iron Wire.—This product exhibits a rising tendency. The present price is 480 to 490 fr. at producing works in Lorraine.

Castings.—Slackening of orders, which is to be observed in almost all departments, has spread to the castings line. The French State Railways have recently accepted a tender for ten turntables of cast pig-iron, of an aggregate weight of 31 tons, at 622 fr. per ton.

Malleable iron castings continue in a favorable position, through a revival in the automobile trade.

Revision of French Duties Proposed

The proposed revision of the present coefficients on French import duties has been submitted by the French customs authorities to the Minister of Commerce, who instituted an inquiry among metallurgists. The metallurgists have suggested the following modifications:

Phosphoric pig iron: The present coefficient of 2 should be maintained, instead of being reduced to 1.8, as proposed.

Ferromanganese: The present coefficient of 6.3 should not be reduced below 4.

On plain sheets: The following coefficients are suggested: 3 mm. and heavier, 2; 1 to 2 mm., 2.5; 6/10 to 1 mm., 2.6; 4/10 to 6/10 mm., 2.8; less than 4/10, 3.

Mechanical Engineers' Annual Meeting in December

The tentative program lists twenty sessions for the forty-third annual meeting of the American Society of Mechanical Engineers, which will be held in New York Dec. 4 to 7, inclusive. The outstanding feature will be a session to be held Wednesday evening, Dec. 6, with a program presented jointly by the American Economic Association and the management division of the American Society of Mechanical Engineers. Dr. Wesley C. Mitchell of the National Bureau of Economic Research will make an address on the subject, "Making Money and Making Goods," and E. M. Herr, president Westinghouse Electric & Mfg. Co., will talk on the "Human Problem in Industry."

Joint sessions will be held also with the American Society of Refrigerating Engineers, the American Society of Safety Engineers and the Stoker Manufacturers' Association.

Three of the standing committees are contributing to the program as follows: The research committee will have two sessions, one at which five papers relating to researches in progress will be given, and the other at which research work in connection with the new steam tables will be discussed. The standardization committee will present a program relating to the system of preferred numbers, which, it is expected, will be of great value to standardization procedure. At the session on training for the industries, reports will be presented on phases of this work.

The Electric Power Club, the commercial organization of electrical manufacturers, will hold a meeting Oct. 30 to Nov. 2, inclusive, at the Grove Park Inn, Asheville, N. C.

EXPORT MARKET DULL

Japanese Sell American Steel at Less Than Current Prices—German Iron Offered to United States

NEW YORK, Oct. 24.—The general dullness in various foreign markets is attributed by most exporters to varied causes. Japan, which until the past few weeks has been the principal and practically the only export market of any importance for American sellers, has suddenly become quiet as a result of the decline in Government and municipal buying. The financial situation in Japan makes it exceedingly difficult for the small merchant to establish letters of credit and stocks of material in greatest demand are on hand. Also low quotations are being received from European iron and steel producing countries. A peculiar situation exists in the Japanese market on light gage black sheets, 13 to the bundle. Because of the large stocks on hand and the general depression in buying, the same brand of sheets that is now being quoted at about $95 per ton, c.i.f. Japanese port by the American seller is selling at $85 per ton and less, out of stocks carried in Japan.

On steel products generally the exporter to Japan is now meeting a strongly developed competition from the Government steel works, which is stated to have piled about 75,000 tons of its products and, being anxious to reduce this stock, is strongly inclined to shade prices. Buyers of bars are offered European material at £9 6s and as low as £9 per ton, c.i.f. port. European black sheets have also been lower in price and there has been some buying in Continental markets, but this business is reported to have declined, preference evidently being for the American product.

Offerings from Stocks at Low Prices

As an example of the depths to which the Japanese market has declined, the following quotations out of stock in Japan, prevailing about Oct. 1, are noteworthy:

	Yen	Dollars
Mild steel bars, round and square, ¼, 5/16, ⅜ and ½ in., per ton	113 to 116	$54.44 to $55.88
Blue annealed sheets, 1/16 in. thick, per ton—		
British	127	61.20
American	154	74.20
Steel plates, ¼ in. and heavier, per ton	100 to 102	48.18 to 49.14
Black sheets, 13 sheets to bundle of 112 lb., per ton—		
British, 62 sen per sheet		69.34
American, 67 sen per sheet		74.87
Wire nails, Tokio assortment, per keg	11	5.30
Tin plate, 100-lb. box	11	5.30
Wire, galvanized, No. 8, B.W.G., per ton	154	74.20
Wire rod, low carbon, No. 5, B.W.G., per ton	102	49.14

Among recent purchases from Japan, the largest noted is an order for 34,000 boxes of oil can tin plate placed by the Nippon Oil Co. with Mitsui & Co., New York, which awarded the business to the Jones & Laughlin Steel Co. Another smaller order for canning tin plate, about 6000 boxes, has also been placed with an American mill, the purchase being made by the Mitsubishi Shoji Kaisha, 120 Broadway, New York, for its fishing company subsidiary, the "Hokuyo" at Kamchatka. The recent tender of the Imperial Government Railways on more than 9000 tons of couplers, totaling about 66,000 pieces, was divided equally between Frazar & Co. and Okura & Co. of New York. No new rail inquiries from Japan are noted. The Imperial Government Railways has asked for bids on about 500 tons of flat bars.

Despite the present dullness, it is believed that a gradual improvement is under way and that next spring will see at least some renewal of sheet buying. Taking an optimistic view of export business, the United States Department of Commerce says of the Far East: "Conditions in the Orient to-day are better than they have been at any time since 1920. Japan is steadily pulling herself out of the slough of economic despond into which she fell in May, 1920."

In China a widespread apathy to all kinds of buying is evident. Shading quotations, according to exporters doing business in this market, has no apparent effect on the customer. This is generally explained by those in touch with the prevailing situation as due to the uncertain political conditions, which are still practically as unsettled as they were several months ago. Lower quotations from European sellers and a belief that the American market will probably see another recession of prices are also attributed as causes of the present lack of interest in purchasing. There is still some activity reported in wire shorts, which, as a rule are always in demand. One exporter has just shipped 350 tons. Commenting on the Chinese situation, Julius Klein, director of the Bureau of Foreign and Domestic Commerce, says: "Business in China is getting better and the recovery will be aided as the foreign demand for that country's products improves and the strain on Chinese purchasing power, due to the unusual drain of invisible exports experienced during 1921, is relaxed."

The Philippines are also quiet in purchasing, compared with recent activity. One exporter to the Far East is negotiating on about 400 tons of relaying rails for the Philippines, which is about the only inquiry of importance on his books from this source.

Pig Iron Imports Show Improvement

Imports of both iron ore and pig iron are improving, says one large importer. Of iron ore, this interest reports the sale of two cargoes (about 5000 tons to a cargo) of ore to the Dominion Iron & Steel Co. in Canada and two cargoes of ore to two different consumers in the United States. Quotations on North African iron ore are now 11c. per unit, c.i.f. Atlantic port.

A large portion of the pig iron imported recently from the Continent, according to this importer was of French origin. The French market, however, has risen rapidly in the past few weeks and the price is now so high as to make French iron difficult to import. During the past few days German pig iron has appeared and this importer reports some business and prospects for more with iron of German origin. The average analysis of this iron, which can be sold at about $26.75 per ton, c.i.f. New York, or less on large tonnages is: Sil., 1.75 to 2.25 per cent; sul. max., 0.05; mn., 0.40 to 0.90; and phos., 0.40 to 0.90. Although high in phosphorus, it is said to be about on a par with the French product. A consumer of pig iron reports having recently purchased 500 tons of Belgian iron, at a price per ton well below the current market on both domestic and imported iron, and has found the iron of good quality and true to analysis. Manganese ore from the Caucasus is now quoted c.i.f. Atlantic port at 27c. per unit for ordinary and 29c. per unit for washed ore.

Steel Industry in Soviet Russia

According to Soviet official periodicals received by the Department of Commerce, for the accuracy of which the department assumes no responsibility, the production of pig iron in the three principal metallurgical regions of Soviet Russia for the first six months of 1922 was 87,100 gross tons, representing an increase of 51 per cent over the corresponding period of 1921. The year's output in the pre-war year of 1913 was 4,145,000 tons. The three districts also produced, according to the Soviet papers, 9,963,000 poods of open-hearth ingots and 7,646,000 poods of rolled steel.

During the first half of 1921 Ural supplied 69 per cent of all pig iron, while the blast furnaces of the South yielded only 11 per cent and those of the Center 20 per cent. During the corresponding period of 1922 the blast furnaces of the Ural supplied 44 per cent and the South 40 per cent.

At the coming election, Nov. 7, Detroit voters will be asked to decide the proposed bonding of $1,900,000 for additional county buildings and an issue of $5,000,000 of public utility bonds for the purpose of making extensions, additions and betterments to the municipal car service.

Iron and Steel Markets

BETTER STEEL MOVEMENT

Coke and Pig Iron Prices Recede Further

Heavy Finished Steel Products Commonly at 2 Cents—Inquiries for 20,000 Cars

Railroad service is unmistakably better in some iron and steel districts, though little improved in others, but few consumers are suffering from lack of steel, and in nearly all markets prices show irregularity.

There is pressure upon the mills, as heretofore, but it is now chiefly from consumers who want delivery of their low priced contract steel, whereas a few weeks ago a price was paid to make sure of getting the steel.

Pittsburgh is still conspicuous for car troubles, but consumers have adjusted themselves to the use of trucks and other measures for the relief of mill congestion.

The bulk of the new business, particularly in the heavier rolled products, is still coming from the railroads, which while pressing car builders for deliveries, are holding out little hope of better service to steel mills.

Fresh inquiries from seven railroads have added fully 20,000 cars to the lists under negotiation and the year promises already to exceed the average of the preceding ten years by 40 per cent. There are new inquiries for 224 locomotives.

Labor conditions are not uniform. At Pittsburgh the supply of common labor is slightly better, in view of the turning of some men to indoor work for the winter. Reports of further steel mill wage advances are without confirmation. Chicago reports that not only are iron and steel works laborers scarce but the production per man is declining, while at the same time some industries are taking labor away from others by bidding up wages.

The price situation in finished steel is summed up in the statement coming from various market centers that plates, shapes and bars are more generally quoted at 2c., Pittsburgh. Consumers are more pointedly seeking lower prices and some especially competitive business in bars went at 1.95c. The extent to which 2c. has been done on plates is a matter of comment. Car works have had further concessions.

Sheet prices have eased off to the extent that independent mills which lately were about $3 a ton higher are now quoting the Steel Corporation's schedule of 3.35c. for black and 4.35c. for galvanized. Demand has fallen off and a number of sheet mills can now make better delivery promises.

Inability to accumulate coal reserves for the winter causes concern to the mills. The amount now in storage would carry them through but a few days of severe weather and the chances are small of getting together an adequate stock before winter sets in.

Coke has yielded further, going as low as $8 for prompt delivery late last week, but $8.50 to $9 is the range on contract furnace coke for delivery to the end of the year.

The buying of 15,000 tons of basic by an Ohio steel company was the chief transaction of a quiet week in pig iron. At Chicago the market seems to be fairly firm at recent quotations, but in Pittsburgh and the East foundry grades are weak and in line with the decline in coke prices have receded from $1 to $2. Decided softness developed at Buffalo. The tendency in foreign iron is also downward, and there is no difficulty in getting prompt delivery, though there are still complaints of congestion at some railroad centers, especially in the East. Foreign iron is pressing for sale at the Eastern seaboard, German iron being offered at new low prices without sale.

The United States Steel Products Co. has taken a contract for 3000 tons of steel for the Santa Luscia bridge in Uruguay, in competition with British, German, French and Belgian fabricators.

Steel bars are quoted in Berlin at 81,200 m., equivalent to 0.94c. per lb. at current exchange of 2⅜c. per 100 m.

THE IRON AGE pig iron composite has continued its drop from the high price at the end of September, being now $30.02 per gross ton. This compares with $19.97 one year ago and with $42.76 two years ago.

No such peak in prices has been shown in steel as in pig iron, the extreme movement of steel in the last ten weeks being less than 2 per cent of the mean price while in pig iron it has been 10 per cent.

Pittsburgh

Sharp Declines in Pig Iron—Steel Pipe Price Advanced

PITTSBURGH, Oct. 24.—The tendency of finished steel prices still is in the direction of what have hitherto been regarded as minimum levels, this being notably true of the heavy tonnage products, sales of which at more than 2c. have become merely a matter of small tonnages and to meet requirements where immediate delivery is essential. Carload lots of bars still are occasionally being sold as high as 2.25c., Pittsburgh, but where delivery is a matter of three or four weeks and a fair sized tonnage is wanted, the market is 2c. Conditions in plates are much the same, and on shapes there seems to be little or no business at higher than 2c. The Steel Corporation still is considerably behind in its deliveries on these products and unable to take business except for deliveries at its convenience, and on such business as it has recently taken its price is 2c., Pittsburgh. Sales of sheets above the recognized market minimum of prices have become rather difficult in the past week or so. Contrary to the drift of other products is an advance of $4 per ton on all classes of steel pipe, effective Oct. 19, announced by the National Tube Co. and subsequently followed by leading independent makers.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 24, 1922	Oct. 17, 1922	Sept. 26, 1922	Oct. 26, 1921
No. 2X, Philadelphia‡	*$32.14*	$33.14	$34.26	$22.84
No. 2, Valley furnace†	*31.00*	32.50	33.00	21.00
No. 2, Southern, Cin'ti†	*31.05*	31.55	31.05	23.50
No. 2, Birmingham, Ala.†	*27.00*	27.50	27.00	19.00
No. 2 foundry, Chicago*	31.00	31.00	32.00	21.00
Basic, del'd, eastern Pa.	29.50	29.50	29.00	20.50
Basic, Valley furnace	30.00	30.00	34.00	19.00
Valley Bessemer, del. P'gh	*34.77*	35.27	35.77	21.96
Malleable, Chicago*	31.00	31.00	32.00	21.00
Malleable, Valley	*32.00*	33.00	34.00	20.50
Gray forge, Pittsburgh	*32.27*	32.77	34.27	21.96
L. S. charcoal, Chicago	36.15	36.15	36.15	31.50
Ferromanganese, furnace	**100.00**	**$67.50	**$67.50	**$60.00

Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$40.00	$40.00
Bess. billets, Pittsburgh	40.00	40.00	40.00	29.00
O.-h. billets, Pittsburgh	40.00	40.00	40.00	29.00
O.-h. sheet bars, P'gh	40.00	40.00	40.00	30.00
Forging billets, base, P'gh	45.00	45.00	45.00	35.00
O.-h. billets, Phila	45.17	45.17	45.17	34.74
Wire rods, Pittsburgh	45.00	45.00	45.00	40.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.00	1.65
Light rails at mill	2.00	2.00	2.25	1.70

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	*2.325*	2.475	2.475	1.95
Iron bars, Chicago	2.50	2.50	2.25	1.75
Steel bars, Pittsburgh	2.00	2.00	2.00	1.50
Steel bars, Chicago	2.10	2.10	2.10	1.75
Steel bars, New York	2.34	2.34	2.44	1.80
Tank plates, Pittsburgh	*2.00*	2.15	2.25	1.60
Tank plates, Chicago	2.30	2.30	2.30	1.75
Tank plates, New York	2.34	2.34	2.49	1.88
Beams, Pittsburgh	2.00	2.00	2.00	1.60
Beams, Chicago	2.20	2.20	2.20	1.75
Beams, New York	2.34	2.34	2.44	1.88
Steel hoops, Pittsburgh	2.90	2.90	2.75	2.25

**C.i.f.

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Oct. 24, 1922 Cents	Oct. 17, 1922 Cents	Sept. 26, 1922 Cents	Oct. 26, 1921 Cents
Sheets, black, No. 28, P'gh	3.50	3.50	3.35	3.00
Sheets, galv., No. 28, P'gh	4.50	4.50	4.35	4.00
Sheets, blue an'l'd, 9 & 10	2.60	2.60	2.50	2.25
Wire nails, Pittsburgh	2.70	2.70	2.70	2.90
Plain wire, Pittsburgh	2.45	2.45	2.45	2.60
Barbed wire, galv., P'gh	3.35	3.35	3.35	3.55
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.00

Old Material, Per Gross Ton:				
Carwheels, Chicago	*$25.50*	$25.00	$24.50	$16.50
Carwheels, Philadelphia	*22.50*	23.00	23.00	17.00
Heavy steel scrap, P'gh	*21.00*	21.50	21.50	14.50
Heavy steel scrap, Phila	*17.50*	18.00	18.00	12.00
Heavy steel scrap, Ch'go	18.50	18.50	18.50	12.00
No. 1 cast, Pittsburgh	24.00	24.00	24.00	17.50
No. 1 cast, Philadelphia	*22.00*	23.00	23.00	17.50
No. 1 cast, Ch'go (net ton)	*20.50*	21.00	21.00	14.00
No. 1 RR. wrot, Phila	22.00	22.00	22.00	16.00
No. 1 RR. wrot, Ch'go (net)	*17.50*	17.75	17.50	13.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	*$8.50*	$10.00	$12.00	$3.25
Foundry coke, prompt	*10.50*	12.00	13.00	4.25

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	14.12½	14.12½	14.25	13.00
Electrolytic copper, refinery	13.62½	13.62½	13.75	12.75
Zinc, St. Louis	**7.00**	6.85	6.87½	4.60
Zinc, New York	**7.35**	7.20	7.22½	5.10
Lead, St. Louis	**6.40**	6.35	6.25	4.40
Lead, New York	6.65	6.65	6.50	4.70
Tin (Straits), New York	**35.25**	34.50	32.50	28.50
Antimony (Asiatic), N. Y.	6.75	6.75	6.75	4.85

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Compcsite Price, Oct. 24, 1922, Finished Steel, 2.467c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Oct. 17, 1922,	2.460c.
Sept. 26, 1922,	2.433c.
Oct. 25, 1921,	2.177c.
10-year pre-war average,	1.689c.

Composite Price, Oct. 24, 1922, Pig Iron, $30.02 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Oct. 17, 1922,	$30.27
Sept. 26, 1922,	32.54
Oct. 25, 1921,	19.97
10-year pre-war average,	15.72

That maximum prices are disappearing is not hard to understand in view of the weaker tendency of fuel prices, which is finding reflection in pig iron values, and in turn shows in a softer undertone to the market for semi-finished steel. Buyers usually hesitate when prices lean in their favor, and the present is no exception to the rule. Evidently, however, buyers are not looking for prices to decline materially, at least not below the average of the orders they have in with the mills, and they continue to specify steadily. Cancellations are unknown and while the back log of business is not especially well distributed among the various producers, it is believed on the whole to be sufficient to keep capacity engaged at its present rate of more than 70 per cent well over the remainder of this year. Car shortages and railroad transportation conditions still are bothersome, but on the whole no worse than they were recently, and possibly the situation is slightly better, save in the case of pipe, some makers of which still are piling product because of lack of cars.

The labor situation appears to be a trifle easier, due to the fact that a good many men are beginning to seek indoor work for the winter. The coke market has added another $1.50 per ton to the declines recorded in the two preceding weeks. While the scrap market is holding fairly well on the better grades of railroad material, it is not at all strong on ordinary grades, and the decline in pig iron prices has begun to have the effect of making dealers a little more anxious for business.

Pig Iron.—Melters still are in a hesitant mood, because they expect lower prices on account of the decline in coke, and very little business has been done in this market. The market on Valley basic iron appears to have been established for the present at $30, as a result of a sale to a central Ohio steel company of 10,000 tons on that basis by a Cleveland interest, and 5000 by a Valley producer at the same price. Foundry iron from Valley furnaces now is being offered at from $31 to $32 for the base grade, a drop of $1.50 to $2 per ton as compared with the quotations of a week ago, but the new figures are largely an adjustment of the market

to the lower coke prices, and demand being very limited, are not supported by many sales. Valley Bessemer iron is off 50c. per ton, to $33, furnace, but only small sales have been made at this figure and it is probable that a sizable inquiry would bring down the price. Malleable iron is quoted at $32, Valley furnace, but this is an appraisal in keeping with lower fuel costs. The Wheeling Steel Corporation has turned on the blast at its Top Mill furnace in Wheeling. This is the only addition to the list of active furnaces in this and nearby districts in the past week, but repairs to the one remaining idle stack of the Jones & Laughlin Steel Co. are nearing completion, and this furnace is expected to be in blast about the middle of November. There are now 86 out of a total of 139 furnaces in blast in this and nearby districts.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$30.00
Bessemer	33.00
Gray forge	$30.50 to 31.50
No. 2 foundry	31.00 to 32.00
No. 3 foundry	30.50 to 31.50
Malleable	32.00

Ferroalloys.—Domestic producers of ferromanganese late last week announced they were prepared to take orders on a limited tonnage of 78 to 82 per cent material at $100, furnace. In the case of one producer, this means a delivered price Pittsburgh common rate points of $104.79, while with another, the delivered price will be $104.91. Neither maker is in production and the offerings are of tonnages held in stock. No sales are reported, although the price named is slightly less than the delivered price of British material which at $101.10, Atlantic seaboard, duty paid, would be $105.89, Pittsburgh. Most consumers are well covered against their requirements over the remainder of the year and demands are few and usually for single carloads. Spiegeleisen is slow and easy. We note one sale of 100 tons of 20 per cent material at $38, furnace. Interest in 50 per cent ferrosilicon is very limited and while producers now are quoting $70 to $75, delivered, or its equivalent, when sold f.o.b. furnace, these prices have found little basis in sales. Most users are covered for the remainder of the year at much lower prices and are not yet showing much interest in their needs beyond Jan. 1. There are occasional sales of ferrotungsten at 90c. to $1 per lb. contained tungsten, f.o.b. makers' works and of ferrochrome at 12c. to 14c. per lb. contained chromium for 4 to 6 per cent carbon alloy, f.o.b. makers' works.

We quote 80 per cent ferromanganese at $100, furnace, or $104.79 to $104.91 delivered Pittsburgh district for domestic and $67.50 c.i.f. Atlantic seaboard, equal to $105.89, duty paid, delivered, for British. Average 20 per cent spiegeleisen, $38 furnace; 16 to 19 per cent, $37; 50 per cent ferrosilicon, domestic, $70 to $75, delivered. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $50.50; 11 per cent, $53.80; 12 per cent, $57.10; 13 per cent, $61.10; 14 per cent, $64.10; silvery iron, 6 per cent, $39; 7 per cent, $40; 8 per cent, $41.50; 9 per cent, $43.50; 10 per cent, $45.50; 11 per cent, $48.80; 12 per cent, $52.10. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $3.66 per gross ton.

Wire Rods.—There is a very fair demand and sales still are reported by independent producers at $47.50 for the base size of soft rods. Business from regular customers of these mills is not priced above $45 and deliveries are being made on old orders carrying still lower prices.

We quote No. 5 common basic or Bessemer rods to domestic consumers, $45 to $47.50; chain rods, $45 to $47.50; screw stock rods, $50 to $52.50; rivet and bolt rods and other rods of that character, $45 to $47.50; high carbon rods, $52 to $57.50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Billets, Sheet Bars and Slabs.—Recent big purchases of sheet bars in the Youngstown district, which have been supplemented by an additional purchase of 5000 tons, making a total of 20,000 tons, all for early delivery, temporarily at least have stayed the downward tendency of prices. This business was all at $40, Youngstown, but it is doubtful whether more tonnages now could be sold at that price, Pittsburgh or Youngstown. Producers, who did not share in this business are understood to have available supplies and while asking $40, would consider firm bids of less. The asking price on billets and slabs still is $40, Pittsburgh or Youngstown, but the market is untested. It is reported that 5000 tons of Bessemer billets are being sought for conversion into skelp, but the company mentioned as the probable buyer denies having made the inquiry. Buyers generally are cautious, because of the uncertainty which exists as to first quarter of 1923 price for finished products, while the weaker tendency in pig iron encourages expectations of lower semi-finished steel prices.

We quote 4 x 4-in. soft Bessemer and open-hearth billets, $40; 2 x 2-in. billets, $40; Bessemer sheet bars, $40; open-hearth sheet bars, $40; slabs, $40; forging billets, ordinary carbons, $45 to $47, all f.o.b. Pittsburgh or Youngstown mills.

Wire Products.—A satisfactory business is reported in nails and plain wire, but demands for barbed wire, fence and other essentially agricultural products is very light and the outlook for early improvement is not considered bright. Box cars are scarce, but shipping difficulties are minimized with some companies through the use of open-top cars fitted with temporary roofs or covered with tarpaulins. We note no change in prices, but manufacturers are not permitting unspecified contracts to stay on their books; rather, they are canceling all tonnage not specified by the end of the contract period. Prices are given on page 1105.

Iron and Steel Bars.—The rail market on merchant steel bars and reinforcing bars now is 2c., base Pittsburgh. The leading independent here is on that basis and this is believed to be the price of the Steel Corporation on tonnages for delivery at its convenience. Occasional sales of mild bars are heard of at 2.15c. and 2.25c., but usually there is only a carload involved and delivery must be made very promptly. There has been no change in iron bars.

We quote steel bars rolled from billets at 2c. to 2.15c.; reinforcing bars, rolled from billets, 2c. to 2.15c. base; rail steel reinforcing bars, 1.90c. to 2c.; refined iron bars, 2.60c. in carloads, f.o.b. mill, Pittsburgh.

Plates.—Only on tonnages for very prompt delivery can 2.25c. base, Pittsburgh, now be obtained and sales at that level usually are for one or two carloads. The price for reasonably early deliveries of sizable tonnages is $1 to $2 less, and buyers content to enter orders for shipment at the convenience of the mills are finding accommodation from an increasing number of producers at 2c. Prices are given on page 1105.

Rivets.—Large producers making the full range sizes are quoting heavy rivets at $3.15 base per 100 lb. for structural and $3.25 for boiler rivets, but there are still some makers who have not adopted these prices and are quoting $3 per ton less. Business carrying the higher figure is limited, but makers have a good back log of orders taken prior to the last price advance. Prices and discounts are given on page 1105.

Steel Skelp.—Better deliveries against low-priced orders are keeping down new inquiries and only on small tonnages for very prompt shipment is it possible for makers to obtain more than 2c.

Sheets.—There still is a rather good demand for sheets for prompt delivery and those makers in a position to take on such business have obtained as high as 3.75c. base for black sheets. Ten days' delivery was promised on one piece of business of this sort. There are some independent makers who lack backlogs and who find it impossible to obtain more than 3.50c. As a rule, all makers have enough business booked to insure the present general rate of operation over the remainder of the year, providing there are no developments which might prompt delays in specifications. The market is slightly irregular, but on the whole firm. The leading interest has been able slightly to increase its operations, but its activities still are well below those of the independents. There is much interest in the first quarter of 1923 prices of this interest; indications now are that its prices will be higher, but the extent of the advance will be governed by steel market conditions around the end of the year. Prices are given on page 1105.

Tin Plate.—The market is showing considerable activity for the time of year and with the leading interest committed against probable production for the remainder of the year, much business is going to the inde-

pendent makers. One order for fairly early delivery calling for 175,000 boxes, recently went to an independent maker. A price of $5 per base box, Pittsburgh, for first quarter of 1923, now seems likely and it would occasion no surprise if the "official" quotation was even $5.25. Costs have gone up so much that a price of at least $5 is considered necessary to show a profit. Such tonnages as have been entered for delivery after Jan. 1, carry no fixed price. On business for delivery over the remainder of this year, the market still is $4.75 per base box.

Cold-Finished Steel Bars and Shafting.—Demand is steady and the market holds firm at 2.50c base, Pittsburgh, for carloads. The market on hot-rolled bars has worked into an easier position, supplies being more readily available, while 2c., which recently was minimum, now is a maximum on sizable lots. This development has not yet affected cold-finished bar prices, because makers have enough business to carry them over the remainder of the year and are not actively seeking new business. Ground shafting is unchanged at 2.90c. base, f.o.b. mill, for carloads.

Track Fastenings.—Although large spikes still can be bought at 2.75c. base, Pittsburgh, the most attractive inquiry of the week, that of the Michigan Central, failed to come to this district; a base of 2.85c., Chicago, taking the order. On spikes and other track fastenings, the Pittsburgh base is passing and prices are generally on an f.o.b. mill basis. Prices are given on page 1105.

Hot-Rolled Flats.—Good demand still is noted for hot-rolled strips, but new business in hoops and bands is much lighter than it has been. In the latter products the mills are well sold up on the narrow and wide sizes, but can take business in the intermediate sizes. Prices are given on page 1105.

Cold-Rolled Strips.—Demand holds up well and on new business there is no shading of the regular quotations of 4.50c., base Pittsburgh.

Bolts and Nuts.—Makers here received orders late last month prior to the last price advance. New business since has been very limited, but there has been no shading of prices, because it is still necessary for manufacturers to provide the means of getting steel from the mills, and this makes for higher costs than usual. Discounts given on page 1105 have found little basis in sales.

Fluorspar.—Illinois and Kentucky producers have advanced prices $4 per ton, now quoting washed gravel fluorspar at $20 per ton f.o.b. mines, for material running 80 to 85 per cent calcium fluoride, and not over 5 per cent silica, and $21.50 for material guaranteed to contain 85 per cent calcium fluoride and not over 5 per cent silica. This advance is declared to be necessary on the basis of producing costs, but may be due in part to the tariff since foreign fluorspar is dutiable under the new tariff at $5.60 a ton.

Structural Material.—Fabricating interests are getting many inquiries, but not many orders, except for very small tonnages. There is not much activity in plain material because fabricators have pretty fair stocks or are protected by mill orders. The market does not appear to be quotable above 2c., except for very early shipment, and such demands are not as numerous as they were recently, due to the slowing down of new construction with the approach of winter. Prices are given on page 1105.

Steel Rails.—Demand for light rails is rather limited and competition for business is sharp enough to make sales at 2.25c., base, rather difficult. The market is quotable from 2c. to 2.25c., base, but the latter price is largely a quotation.

We quote 25 to 45-lb. sections, rolled from new steel, 2c. to 2.25c. base; rolled from old rails, 1.90c. to 2c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—The National Tube Co. surprised the trade considerably last Thursday by coming out with new cards making a horizontal increase of $4 per ton in all classes of pipe and in lapwelded boiler tubes. Unlike former advances, there had been no previous intimation that a change was imminent. Independent companies, as was to be expected, promptly followed the advance. It is stated in explanation for the advance that it merely puts the market on the basis of current costs. The advance made by independents on Aug. 15, last, and by the National Tube Co. on Aug. 23, did not profit pipe makers any because they had so much old tonnage, notably in the butt weld sizes, at the time, and then came the wage increase on Sept. 1. Demand for standard pipe still is strong, but oil country goods could do much better. It is stated that while present demands for the latter are moderate, stocks in distributing hands are light and that improvement in the oil situation will find prompt reflection. A resumption in the Osage field is possible before long as private companies in that field are protesting the Government order which led to the suspension. Makers still are piling some tonnage because of car shortages. Wrought iron pipe activity is chiefly on old rather than new business with prices unchanged. Discounts are given on page 1105.

Boiler Tubes.—Action of the National Tube Co. in advancing lap welded tubes $4 per ton, as of Oct. 19, merely met a similar action by several independent makers about three weeks ago. Heavy demand still is reported for tubes, but with steel doing better than iron goods. There has been no change in the latter. Discounts are given on page 1105.

Coke and Coal.—The market on furnace coke has grown decidedly easier since a week ago, standard 48-hr. fuel dropping from $10 per net ton oven, to $8 late last week, while off grade offerings have been as low as $7. This development is the result of production running ahead of consumption, but the decline in prices changed this condition and the market to-day was firm at $8.50 for spot tonnages of standard grade coke, while on tonnages calling for delivery over the remainder of the year the market has been established at $9 by transactions involving the requirements of two stacks or approximately 30,000 tons a month. The market is easier also on foundry coke, but not to the extent it is on furnace grade. The minimum on standard 72-hr. coke is $10.50 per net ton at oven, with some sales still being made at $2 above that level. There has not been much change in the coal market, but activity is lacking and it is more of a buyers' than a sellers' affair. We quote mine run steam coal at $3 to $3.50 per net ton, f.o.b. mines; by-product grade at $3.75 to $4.50, and gas coal at $4 to $4.50 for mine run and $5 for lump.

Old Material.—The market here has grown rather dull since last accounts and while prices are not materially affected by this development, the undertone is hardly as strong as it has been. This, however, is explained largely by offerings by dealers, who as a result of railroad conditions have been forced to reconsign shipments. Dealers and melters have been offered such tonnages of heavy melting steel as low as $21, and on the bases of what could be done this grade is quotable at $21 to $21.50. Supplies of scrap are moderate and this is developed every so often when a mill comes in for a tonnage. Machine shop turnings have sold as high as $17 and do not seem to be available at less than $16.50. There is no weakening in prices of the better grades of railroad steel.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton	
Heavy melting steel	$21.00 to	$21.50
No. 1 cast, cupola size	24.00 to	25.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; Franklin and Williamsport, Pa.	22.00 to	22.50
Compressed sheet steel	19.50 to	20.00
Bundled sheet sides and ends	17.00 to	18.00
Railroad knuckles and couplers	24.50 to	25.00
Railroad coil and leaf springs	24.50 to	25.00
Low phosphorus standard bloom and billet ends	25.00 to	26.00
Low phosphorus, plates and other grades	24.00 to	25.00
Railroad malleable	22.00 to	22.50
Iron car axles	30.00 to	32.00
Locomotive axles, steel	27.00 to	28.00
Steel car axles	24.00 to	25.00
Cast iron wheels	25.25 to	25.75
Rolled steel wheels	24.50 to	25.00
Machine shop turnings	16.50 to	17.00
Heavy steel axle turnings	18.00 to	18.50
Short shoveling turnings	18.00 to	18.50
Cast iron borings	18.50 to	19.00
Heavy breakable cast	21.00 to	21.50
Stove plate	17.50 to	18.00
Sheet bar crop ends	24.00 to	25.00
No. 1 railroad wrought	20.00 to	20.50

Chicago

Strong Demand Continues with Railroads Still Leading Factor

CHICAGO, Oct. 24.—On the one hand, steel mill production is limited by inadequate transportation while on the other hand the bulk of new business, particularly in the heavier rolled products, is coming from the railroads. Crippled because of insufficient rolling stock, the carriers are pressing the car builders for deliveries of new cars. The latter, however, are unable to build cars to the limit of their capacity because of slow deliveries from the mills. Neither the car builders nor the mills entertain much hope of increasing operations for several months. The supply of cars available for the shipment of products from steel works is slightly improved, but shortage of cars at the coal mines has reduced receipts of fuel.

The leading interest continues to operate 15 blast furnaces, but has suffered a slight loss in finished steel output, which is now just under 70 per cent. The production of the Inland Steel Co. remains unchanged at between 65 and 70 per cent. Inability to accumulate coal reserves for winter constitutes the principal worry of the mills. The amount in storage now is hardly enough to carry them through a few days of severe weather and with the season rapidly advancing, the chances of piling a sufficient reserve are steadily diminishing. The advent of low temperatures will release a heavy demand for coal for heating purposes, which in view of its imperative nature will make it more difficult for industries to secure their requirements.

Shortage of labor is another factor blocking increased plant operations. Not only are men scarce but the production per man is declining. To make matters worse, some industries are taking labor away from others by bidding up wages.

Although demand appears to have fallen off in other parts of the country, there is no lack of business here, notwithstanding the fact that inquiry for prompt material is less urgent than during and immediately after the twin strikes. Railroad car buying is of large proportions and is expected to continue for several months. The St. Paul and the Rock Island alone are expected to buy a total of 18,000 cars, which will call for fully 100,000 tons of steel, exclusive of the axles and wheels. Other recent inquiries include 3000 cars wanted by the Northern Pacific, 2500 for the Pere Marquette and 3000 for the Louisville & Nashville. The problem of local mills is not to sell but to ship the business on their books and in immediate prospect. They are finding it difficult to satisfy all their customers and are trying to distribute tonnage in such a manner as to permit all plants dependent on them to operate at the best possible rate. The buoyancy of demand is indicated by the fact that the bookings of a prominent producer are fully as heavy as in September, excluding the rail and track supply orders received in that month.

Pig Iron.—The market is quiet and many melters are holding back their inquiries in the hope that prices will again sag. There are no indications of further weakness, however, and prices of Northern iron are firm at the new base of $31, furnace. In fact a number of spot cars have been sold at as high as $32, base, within the past few days. Notwithstanding the resistance of buyers, some fair sized orders are being placed indicating a pressing need for material. A stove manufacturer who had not been in the market for a considerable period is inquiring for 400 tons of foundry to take care of increased business. A Michigan hot air furnace company is in the market for a like tonnage with the probability that it will buy additional iron later. A Wisconsin foundry has closed for 1500 tons of malleable for the rest of the year while a local railroad equipment manufacturer has ordered 1500 tons of foundry for the same delivery and still has a considerable tonnage to buy. Spot demand is good as evidenced by sales covering lots ranging from carloads up to 100 or 200 tons. There is little first quarter buying, among the few sales for that delivery being one of 500 tons of foundry bought by a Michigan user at the ruling price of $31, base, furnace. Deliveries from furnaces are improved as car supply is somewhat better. Shipments from the South are also coming through more freely, although transportation in that section is still far from normal. Prices of Southern iron appear to range from $27 to $28, base, Birmingham. We note several sales of cars on consignment at the $27 base. The Michigan inquiry for 1500 tons of 14 to 16 per cent Bessemer ferrosilicon is not yet closed. Canadian producers are understood to have quoted as low as $45 delivered, or about $5 under the domestic market.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.15
Northern coke, No. 1, sil. 2.25 to 2.75	32.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	31.00
Northern high phos.	31.00
Southern No. 2	$33.00 to 34.00
Malleable, not over 2.25 sil.	31.00
Basic	31.00
Low phos., Valley furnace, sil. 1 to 2 per cent copper free	38.00
Silvery, sil. 8 per cent	46.29

Ferroalloys.—Spiegeleisen and ferromanganese are quiet. Ruling prices on 50 per cent ferrosilicon are difficult to ascertain, as a number of important producers are still out of the market. A recent sale at Milwaukee, however, is reported to have been made at about $86 delivered.

We quote 80 per cent ferromanganese, $108.66, delivered; 50 per cent ferrosilicon, $65 delivered (nominal); spiegeleisen, 18 to 22 per cent, $47 to $48, delivered.

Plates.—The market is sustained by railroad car buying which, judging from fresh inquiries, promises to continue for some time. Further business from tank fabricators is also looked for, as several oil companies are known to be quietly negotiating for a considerable number of storage tanks. Prices are firm and no early change is expected in view of the heavy bookings of mills. Producers are more concerned about shipping than selling.

The mill quotation is 2.10c. to 2.30c., Chicago. Jobbers quote 2.90c. for plates out of stock.

Bars.—New business in soft steel bars is fully as large as in September and local mills are experiencing difficulty in meeting the demand. Prices are strong, but no early change is looked for. The leading interest continues to quote 2c., Chicago, for indefinite delivery, while the foremost independent is practically sold up for this quarter at 2.10c., Chicago, and is not yet ready to announce its first quarter price. Demand for bar iron continues to lag, no doubt because it is considerably higher than steel. Even with the price at 2.50c., mills are finding it difficult to break even. One important bar iron plant was shut down indefinitely to-day because of inability to make a profit. Hard steel bar prices are unchanged and mills are well booked ahead.

Mill prices are: Mild steel bars, 2c. to 2.10c., Chicago; common bar iron, 2.50c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 2.80c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.80c. for rounds and 4.30c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 2.50c. base; hoops, 4.15c.; bands, 3.55c.

Rails and Track Supplies.—The market is without unusual features. Light rail business is good and small orders for bolts, spikes and tie-plates are being placed.

Standard Bessemer and open-hearth rails, $43; light rails rolled from new steel, 2.15c., f.o.b. makers' mills.

Standard railroad spikes, 2.85c. to 3c., mill; track bolts with square nuts, 3.85c. to 4c., mill; iron tie plates, 2.50c.; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.50c. base and track bolts 4.50c. base.

Wire Products.—Mill operations are no better owing to the continued shortage of steel and fuel, both ascribable to lack of cars. Far behind in its shipments

against present obligations, the leading interest is taking new business sparingly. Demand continues heavy for this season and reports from some of the agricultural districts are more favorable than for some time. The advance in corn has encouraged the farmers in the corn belt. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1105.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire and No. 9 and heavier bright basic wire, $3.30 per 100 lb.; common wire nails, $3.45 per 100 lb.; cement coated nails, $2.90 per keg.

Bolts and Nuts.—Some business is being booked at the new discounts, but the September quotations are still being made by important sellers. Specifications are lighter, no doubt because buyers loaded up heavily under their third quarter contracts.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.85c.; machine bolts up to ⅝ x 4 in., 50 per cent off; larger sizes, 50 off; carriage bolts up to ⅝ x 6 in., 45 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $2.75 off; blank nuts, $2.75 off; coach or lag screws, gimlet points, square heads, 55 per cent off.

Sheets.—Unfilled obligations of local mills insure operations throughout the rest of the year. There is no pressure to sell at present, but the independent producer will soon entertain inquiries for first quarter. Eastern mills are experiencing little trouble in getting 3.50c. and 4.50c., base Pittsburgh respectively, for black and galvanized.

Mill quotations are 3.35c. to 3.50c. for No. 28 black, 2.50c. to 2.60c. for No. 10 blue annealed and 4.35c. to 4.50c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago, 4c. for blue annealed, 4.85c. for black and 5.85c. for galvanized.

Reinforcing Bars.—Demand is unusually buoyant in the face of the approach of the winter season, which usually brings with it an appreciable slackening in trade. A considerable number of new projects have come into the market and at the same time demand for small tonnages out of warehouse is unabated. Dealers find mill deliveries somewhat improved but still uncertain. Prices are firm and the quotation for material out of warehouse is unchanged at 2.50c. Recent lettings include:

E. J. Brach & Sons, candy factory, Chicago, 350 tons to Paul J. Kalman Co.

State highway work, Missouri, 200 tons to Concrete Steel Co.

William Hatch School, Oak Park, Ill., 100 tons to Corrugated Bar Co.

Knights of Pythias, lodge and office building, South Bend, Ind., 160 tons to Concrete Steel Co.

Department of Public Works, Chicago, 180 tons to Paul J. Kalman Co.

Rochester Packing Co., packing house, Rochester, N. Y., 100 tons to Corrugated Bar Co.

Fireproof Storage & Warehouse Co. building, Waco, Texas, 200 tons to Paul J. Kalman Co.

Pending work includes:

Grain Elevator, Ft. Worth, Texas, 500 tons, general contract awarded to a San Antonio company.

Elks Lodge, Louisville, Ky., 250 tons, bids on general contract to be taken Oct. 27.

Girls' high school, Louisville, Ky., 200 tons.

St. Francis Convent, Dubuque, Iowa, 350 tons, bids on general contract to be in Oct. 25.

United Butchers Packing Co., packing house, Chicago, 425 tons, bids on general contract taken.

High school, LaPorte, Ind., 150 tons, bids on general contract to be in Oct. 27.

High school, Evansville, Ind., 150 tons.

Chicago Mill & Lumber Co., plant, Chicago, 300 tons.

Vendome Apartments, Milwaukee, 100 tons, to Concrete Engineering Co.

Steel Castings.—The miscellaneous castings for 1000 Chicago & Northwestern cars have been placed at the new discounts. A considerable tonnage of castings for cars recently ordered is still unclosed and in view of large new car inquiries, the outlook of the steel foundry business is good.

Structural Material.—With the approach of the winter season, structural lettings are declining both in size and number. Only three awards are reported this week and the largest involves 400 tons. Fabricators are well booked, however, and will probably be busy until demand revives. Prices of plain material are unchanged. Although less new business is coming to the mills from the fabricators, the tonnage of shapes which is being brought by car builders is large.

The mill quotation on plain material is 2.10c. to 2.20c., Chicago. Jobbers quote 2.90c. for plain material out of warehouse.

Cast Iron Pipe.—Transportation conditions in the South are steadily improving, but with the construction season nearing a close in this territory, municipalities are disposed to postpone action on their requirements in the belief that prices are not likely to advance any further. The National Cast Iron Pipe Co. will supply 300 tons for a Hamilton, Mo., contractor's job. Westmont, Ill., has let 700 tons to a contractor who is not expected to place the pipe for some time. Ferndale, Mich., took bids yesterday on 400 tons of 6-in. Detroit will receive bids Oct. 28 on 100 tons of fittings. Fort Atkinson, Wis., rejected bids on 80 tons.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $55.20 to $57.20; 6-in. and above, $51.20 to $53.20; class A and gas pipe, $3 extra.

Old Material.—Some evidences of weakness are to be noted in the market, ascribable in part to the shutting down of an important bar iron mill. No sustained decline in prices is looked for, however, in view of transportation and labor conditions. Shortage of labor is preventing the collection and sorting of scrap and lack of cars is impeding the delivery of material from seller to user. In view of immigration restrictions, there appears to be no prospect of better labor supply and with cold weather approaching it is doubtful whether better railroad service can be hoped for until next spring. The stability of the present market level seems assured and some observers look for advances in view of the disparity between scrap and pig iron prices. Current buying is of a hand-to-mouth character. At the same time, there is pressure for deliveries against contracts as car scarcity has tended to delay shipments.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$24.50 to	$25.00
Cast iron car wheels	25.50 to	26.00
Relaying rails	27.50 to	32.50
Rolled or forged steel car wheels	23.00 to	23.50
Rails for rolling	20.50 to	21.00
Steel rails, less than 3 ft	21.50 to	22.00
Heavy melting steel	18.50 to	19.00
Frogs, switches and guards cut apart	18.50 to	19.00
Shoveling steel	18.25 to	18.75
Drop forge flashings	12.50 to	13.00
Hydraulic compressed sheet	16.00 to	16.50
Axle turnings	16.00 to	16.50
	Per Net Ton	
Iron angles and splice bars	23.00 to	23.50
Steel angle bars	18.50 to	19.00
Iron arch bars and transoms	23.00 to	23.50
Iron car axles	26.00 to	26.50
Steel car axles	19.50 to	20.00
No. 1 busheling	15.50 to	16.00
No. 2 busheling	10.00 to	10.50
Cut forge	17.00 to	17.50
Pipe and flues	12.50 to	13.00
No. 1 railroad wrought	17.50 to	18.00
No. 2 railroad wrought	17.00 to	17.50
Steel knuckles and couplers	20.50 to	21.00
Coil springs	22.00 to	22.50
No. 1 machinery cast	20.50 to	21.00
No. 1 railroad cast	19.50 to	20.00
Low phos. punchings	17.50 to	18.00
Locomotive tires, smooth	18.50 to	19.00
Machine shop turnings	11.00 to	11.50
Cast borings	13.50 to	14.00
Stove plate	17.50 to	18.00
Grate bars	17.00 to	17.50
Brake shoes	17.00 to	17.50
Railroad malleable	21.50 to	22.00
Agricultural malleable	21.50 to	22.00

Roland P. Chase, Saginaw, Mich., manufacturer of a new tool truing device, has taken over the plant of the American Stamping & Mfg. Co. at Midland, Mich., and will transfer his business to Midland.

New York

Plates Not Very Firm at 2c—Bar Iron and Pig Iron Lower

NEW YORK, Oct. 24.—Another quiet week has passed with prices showing a tendency downward. On eastern Pennsylvania irons, $30 is the usual quotation for No. 2 plain, but the market is weak at that figure and it is believed that $29 could be done on an attractive tonnage. Reports from Buffalo still show weakness with $29.50 as the usual quotation. Quotations on foreign iron are about as they have been, $30 for Scotch and $27 to $28 on Continental, but no difficulty is experienced in getting prompt delivery. The principal buying of the week was by the Worthington Pump Co. which purchased 1000 tons of domestic and 400 tons of foreign, the latter for its Holyoke plant for delivery over the remainder of the year. The New York Central placed an order for 1200 tons for prompt delivery and other sales aggregated about 2000 tons. Considerable delay in deliveries is still being caused by congestion of railroads, which are concentrating their efforts in carrying coal.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25.....$34.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75.... 33.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25..... 32.27
Buffalo, sil. 1.75 to 2.25..... 34.41
No. 2 Virginia, sil. 1.75 to 2.25.....No. sales

Ferroalloys.—Business in ferromanganese is confined to small lots of British ferromanganese for shipment within the next month or two at the prevailing quotation. Only a little domestic alloy is available at about $100, furnace. Very little business is reported in spiegeleisen, quotations for which are unchanged. No business is reported in manganese ore. There have been sales of a few lots of 50 per cent ferrosilicon as high as $70, furnace, and there are also inquiries in the market aggregating 100 to 200 tons. Quotations are as follows:

Ferromanganese, domestic, furnace, nominal, per ton.....$100.00
Ferromanganese, British, c.i.f., per ton...$67.50
Spiegeleisen, 17 to 19 per cent, furnace...$38.00
Spiegeleisen, 20 per cent, furnace or duty paid .....$38.00 to $39.00
Ferrosilicon, 50 per cent, delivered, per gross ton, carloads.....$70.00 to $75.00
Ferrotungsten, per lb. of contained metal, 70c. to 85c.
Ferrochromium, 4 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered .....12c. to 14c.
Ferrovanadium, per lb. of contained vanadium .....$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, in carloads, per net ton.....$200.00

Ores

Manganese ore, foreign, per unit, c.i.f. 29c. to 30c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal .....$7.50 to $7.75
Chrome ore, basis 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard..$18.00 to $25.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York.....55c. to 60c.

Cast-Iron Pipe.—Although municipal tenders are no longer appearing, private buying continues strong, unusually so for this season. Prices are firm and are expected to continue unchanged until the first of the year. We quote per net ton, f.o.b. New York, in carload lots as follows: 6-in. and larger, $54.50; 4-in. and 5-in., $59; 3-in., $64.80, with $4 additional for Class A and gas pipe. Soil pipe is quiet, the usual seasonal dullness having set in. We quote per net ton, delivered New York, discounts of both Southern and Northern makers as follows: 2 to 6-in. standard, 25 to 30 per cent off list; heavy, 34 and 35 per cent off list.

Warehouse Business.—Most warehouses report prices firm and business active. Structural material is still in strong demand and dealers in heavy hardware note a good business in bolts, nuts, rivets and similar material. The sheet market, however, despite difficulty being encountered in obtaining shipments from mill, is weak. The range of prices that has prevailed for some time continues; No. 28 gage black sheets, 4.50c. to 4.90c. per lb. and No. 28 gage galvanized, 5.50c. to 5.90c. per lb. Even the low prices are said to be still open to shading by some dealers. Although spring steel prices are still on a 4.50c. per lb. base in this district, a growing shortage of some sizes seems evident from numerous transactions between sellers here, in Boston and in Philadelphia. Some dealers report that they have been unable to place orders with the leading interest on tin plate for earlier than first quarter of next year delivery, and warehouses handling wire and wire products are running low in some cases. The leading interest here has promised a gradual improvement in shipments of orders, but delays are still long. Dealers announce a reduction of discounts from list prices on steel pipe amounting to about $4 per ton. This increase added to a rise in price of about $2 caused by a slight change made Oct. 1, in figuring discounts from list, shows a total advance this month on steel pipe of about $6 per ton. We quote prices on page 1122.

High Speed Steel.—Quietness continues. Some activity is reported in high carbon tool steels. Producers generally quote 18 per cent tungsten high speed steel at 75c. to 80c. per lb., with special brands of some companies ranging up to 90c. per lb.

Finished Iron and Steel.—Nearly all mills are now quoting 2c., Pittsburgh, on desirable lots of plates, shapes and bars. Plates, until recently the strongest of the three products, is now the weakest, and it is only in plates that suggestions of quotations below 2c. are heard. Some of the large buyers, such as railroad companies, oil companies and car builders, say that they are able to buy in large lots for fairly early delivery at 1.90c. to 1.95c., Pittsburgh, though in some instances these prices are given only with shipment at mill convenience. Small lots of plates, shapes and bars have brought prices above 2c. in the past week, but such sales do not involve a large quantity of steel even in the aggregate. The mill position of steel companies rolling plates is the least satisfactory of any steel product. In butt weld pipe, bars, wire products, tin plate and sheets, in the order named, the condition of order books and the present situation as to demand are all that the mills could wish for; in fact, pressure for some of these products is a little too insistent to suit the mills. Rails may also be added to this list, of course, as the total rail tonnage put on the books is probably 1,500,000 to 2,000,000 tons. Several roads which made blanket reservations prior to Oct. 1 have been sending in their specifications within the past two weeks and mills are well provided with rail tonnage for the winter months. Activity in structural steel is at low ebb. In cars there are inquiries for 6500 now pending, with inquiries to be issued within the next week or so for an additional 10,000. Concrete bars are in fairly good demand and the following are some of the larger jobs which have been taken by the Concrete Steel Co. within the past few days: 3500 to 4000 tons for a waterworks at Tulsa, Okla.; 500 tons for a school building in St. Louis; 220 tons for a factory for the Chesbrough Mfg. Co. at Pittsburgh; 100 tons for the Foster Avenue sewer, Brooklyn. Eastern makers of bar iron have reduced quotations to 2.05c., Pittsburgh, for carload lots and to 2.20c. for less than carloads.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, structural shapes and steel plates, 2.34c.; bar iron, 2.34c.

Coal and Coke.—Furnace coke is decidedly softer with quotations ranging from $8.25 to $8.50 on standard grades and as low as $6.50 being named for coke which is described as of moderately high sulphur. In foundry coke, the usual quotation is $11, with $12 asked by some sellers. In by-product coke $14, seaboard, is still asked, but it is doubtful whether this quotation can long be maintained in view of the receding prices on beehive oven coke. It is true, however, that users of by-product coke have had the advantage of lower prices than those on beehive coke for several months, and producers of by-product grades are not disposed to hurry in lowering quotations. Steam coal is quoted at $3.25 to $3.50.

Old Material.—The slight recession of the market continues, prices generally still showing weakness. Both the embargoes and the labor shortage being experienced by the mills are pointed to as causes of the

present declining market, but the lack of any large stocks of scrap in yards is held as a good sign that the present decline can only be temporary. No. 1 heavy melting steel is quotable this week at $13.50 to $14, based on $17.50 per ton being paid by Alan Wood Iron & Steel Co. and $18.50 per ton for Johnstown. One seller here points out that for shipment to Buffalo the maximum obtainable is $17 per ton, which with a rail rate of $5.17 figures back to only $11.83 per ton, New York. On railroad steel The Bethlehem Steel Co. is paying $17.50 per ton, which, with a freight rate of $2.65 to Bethlehem, makes the price New York $14.85. A fair range of quotations on railroad steel at present is $14.25 to $14.75 per ton. Both Milton and Columbia are out of the market on specification pipe and Lebanon is paying $16 per ton, which is $12.22 per ton New York. Stove plate is weak, a range of $13.50 to $14.50 per ton about covering present transactions. On stove plate $16.50 has been paid for shipment to Bridgeport.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$13.50 to $14.00
Steel rails, short lengths, or equivalent	14.25 to 14.75
Rails for rolling	15.50 to 16.00
Relaying rails, nominal	27.00 to 28.00
Steel car axles	17.00 to 18.00
Iron car axles	23.00 to 24.00
No. 1 railroad wrought	16.00 to 16.50
Wrought iron track	14.50 to 15.00
Forge fire	11.50 to 12.00
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (clean)	12.50 to 13.00
Machine-shop turnings	12.25 to 12.75
Mixed borings and turnings	12.25 to 12.75
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate	13.50 to 14.50
Locomotive grate bars	14.00 to 14.50
Malleable cast (railroad)	13.50 to 14.00
Cast-iron car wheels	14.50 to 15.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$20.00 to $21.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	17.50 to 18.00
No. 1 heavy cast, not cupola size	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	13.50 to 14.00

Buffalo

Weakness in Pig Iron—Car Situation Does Not Improve

BUFFALO, Oct. 24.—Weakness in price is more apparent and demand is even less than the previous week. Two furnaces are quoting $30 for No. 2 plain, but a broker is selling the same grade at $29.50, No. 2 X at $30 and No. 1 X at $30.50. About 3000 tons covers the volume of new business. The Bethlehem Steel Co. operating the Lackawanna plant is a factor in merchant iron. The Hanna Furnace Co., operating two furnaces, is running one on malleable and one on foundry, and the Wickwire Steel Co. is making basic iron only. None of the Buffalo sellers has opened its books for first quarter 1923 business.

We quote f.o.b. per gross ton Buffalo as follows, the higher prices being for early shipment:

No. 1 foundry, 2.75 to 3.25 sil.	$30.50
No. 2X foundry, 2.25 to 2.75 sil.	30.00
No. 2 plain, 1.75 to 2.25 sil.	29.50
Basic	30.00
Malleable	31.00
Lake Superior charcoal	34.28

Warehouse Business.—Softening in mill prices and the critical car situation are probably the reasons for a lull in warehouse demand which developed within a few days.

Finished Iron and Steel.—Advances on pipe prices and stronger demand for tinplate, which are unusual because of this particular season, are the two features of the finished material market this week. Although there are rumors of a weakness in bar prices, there are no admissions of less than 2c., and on some business as high as 2.15c. has been paid. Forward buying is slower and there seems to be more of a tendency to place business covering only immediate needs. Hoops and bands have advanced from 1.75c. to 1.90c. per 100 lb. A price of 2c. on plates is reported made by one seller in the face of considerable competition. Reinforcing bar business for less than 100-ton lots is brisk and weather conditions have not yet affected work requiring this material.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.20c.; plates, 3.20c.; soft steel bars, 3.10c.; hoops, 4.10c.; bands, 3.90c.; blue annealed sheets, No. 10 gage, 4.05c.; galvanized steel sheets, No. 28 gage, 5.85c.; black sheets, No. 28, 4.85c.; cold rolled round shafting, 3.95c.

Old Material.—Some sales of small tonnages of heavy melting steel have been made, but the mills which ordinarily purchase in quantities that determine the markets are not interested in paying what the dealers ask for on heavy melting steel. The car situation is worse and is continuing to affect production. Buffalo dealers with orders taken at higher prices for shipment to Youngstown and Pittsburgh find the transportation situation is affecting movement of this material.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$20.00 to $21.00
Low phos., 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	19.00 to 20.00
Car wheels	21.00 to 22.00
Machine-shop turnings	14.50 to 15.50
Cast iron borings	17.50 to 18.00
Heavy axle turnings	17.50 to 18.50
Grate bars	16.00 to 17.00
No. 1 busheling	17.00 to 18.00
Stove plate	17.00 to 18.00
Bundled sheet stampings	14.00 to 15.00
No. 1 machinery cast	21.00 to 22.00
Hydraulic compressed	18.00 to 19.00
Railroad malleable	20.50 to 21.50

Cleveland

Pig Iron Declines—North Central Ohio Steel Plant Buys 15,000 Tons of Basic

CLEVELAND, Oct. 24.—Reports of both pig iron and steel producers indicate an improvement of the transportation situation. More cars are available for handling steel and pig iron at various producing centers than during the past few weeks. The coal movement up the lakes fell off over 100,000 tons last week to 90,900 tons. Many of the lake boats are tied up in the grain trade, and the demands from the Northwest for fuel are less insistent than a few weeks ago. This makes more fuel available for other sections.

Pig Iron.—Prices further declined and the market appears weak at the present levels. Prices on foundry and malleable grades are about $1 per ton lower than a week ago. A north central Ohio steel plant during the week purchased 10,000 tons of basic iron from a Cleveland producer and 5000 tons from a Valley producer at $30. The market generally is quiet. Consumers of foundry iron are looking for further reductions in prices and are buying only for their early requirements. Inquiries for the first quarter of next year have virtually disappeared from the market. Although a number came out, only one sale for that delivery was reported. One lake furnace is now quoting foundry iron at $30.50 to $31 as compared with a maximum of $32.50 a week ago and reports a number of sales aggregating 3500 tons, including one lot of 800 tons to a Northern Ohio foundry. A Valley furnace is now quoting foundry iron at $31. Locally prices have not yet reacted to levels quoted in outlying districts. One producer has held to $33 during the week for foundry iron and reports several sales in lots up to 300 tons for delivery in Cleveland and immediate vicinity at that price. Southern foundry iron is about $1 per ton lower.

Another lot of 500 tons of foreign low phosphorus iron has been sold in this territory. This brought a price equal to slightly less than $37, Valley furnace. We note a sale of 400 tons of Eastern low phosphorus iron at $37.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$30.00
Northern No. 2 fdy., sil. 1.75 to 2.25	32.75 to 33.50
Southern fdy., sil. 1.75 to 2.25	33.00 to 33.50
Malleable	32.75 to 33.50
Ohio silvery, sil. 8 per cent	44.52 to 45.52
Standard low phos., Valley furnace	37.00 to 38.00

Iron Ore.—Iron ore interests are naturally considerably disappointed in the report of the examiner of the Interstate Commerce Commission made in Washington Saturday on rail rates from the mines to the upper lake ports. The Lake Superior Iron Ore Association will doubtless take advantage of its right to protest against the findings of the examiner, whose report must be approved by the commission before it becomes effective. [See Washington letter, page 1065.]

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Ore Movement.—The iron ore movement during the week has been affected considerably by the car shortage and some ore is going on docks that would otherwise be sent direct to furnaces. The Pennsylvania railroad has declared an embargo against its ore dock at Erie, Pa., for the remainder of the season, and shipments for the East that have heretofore been made to Erie will be made to Ashtabula. Delays of boats at Buffalo in the grain carrying trade have caused a temporary scarcity of vessel tonnage and there has been some wild chartering at a premium over regular rates. Several sales of ore in lots up to 15,000 tons were made during the week to consumers who will need a little more ore and placed their orders in time for delivery before the close of the season of navigation.

Ore on Hand.—Lake Superior ore on hand at furnaces and Lake Erie docks Oct. 1 was over 4,000,000 tons in excess of the amount on the same day a year ago, according to the monthly report prepared by the Lake Superior Iron Ore Association. The amount for October was 41,805,430 tons as compared with 37,746,943 tons on the same date a year ago. On Oct. 1 there was 32,776,722 tons of Lake Superior ore at furnaces as compared with 29,565,935 tons on Sept. 1. Consumption of Lake Superior ore in September was 2,989,545 tons, as compared with 2,589,251 tons in August.

Coke.—Coke prices have further declined. A local consumer reports the purchase of a small lot of Connellsville furnace coke at $8.75 per net ton and later was offered coke at $8.25. Standard Connellsville foundry coke is down to $12 to $13 with some, not regarded as best grade, offered at $11. Plenty of foundry coke is being offered, but little is being shipped because of the car shortage.

Semi-Finished Steel.—Sheet bars, billets and slabs are quoted at $40, Pittsburgh or Youngstown, and while there is no evidence of lower quotations, buyers are inclined to think that this price might be shaded.

Bolts, Nuts and Rivets.—Bolt and nut orders at the new prices are few in number as most consumers had placed contracts before the advance, but specifications on these contracts are heavy, some makers reporting that orders so far this month are equal to the corresponding period in September. New rivet orders are rather light. The leading Cleveland producer is holding at 3.15c for structural and 3.25c for boiler rivets, and is taking some business at these prices in spite of the fact that some makers are reported to be still quoting the old prices, which are $3 per ton lower.

Finished Iron and Steel.—The volume of business is rather light and interest is centered in the price situation. Owing to the tendency to weakness and considerable irregularity as to prices, consumers of steel bars are sounding the market carefully and exerting considerable pressure on mills for lower quotations. Competition of sellers is keen and there are fairly well authenticated reports of a 1.95c. quotation being made by independent producers for round lots of steel bars for early shipment. However, the ruling quotation is 2c. for desirable orders and some business is being booked at 2.10c. Plates are quoted at 2c. to 2.10c. for fairly early deliveries, but local mills and some other independent mills are still holding to 2.25c. This price, however, usually applies to small lots or is for prompt shipment.

Structural material ranges from 2c. to 2.10c., but the lower price is now more common. The volume of business is rather light. Some of the mills are getting in better shape on deliveries and there is not so much insistence on the part of buyers for deliveries on contracts as a few weeks ago. Automobile companies are buying some forging steel and alloy steel for deliveries extending into February. Ohio shops are figuring on an order for tanks for oil cars requiring 2000 tons of plates and an inquiry has come out for 10 stills requiring 500 tons. Business in structural lines is quiet.

Jobbers quote steel bars, 2.91c.; plates and structural shapes, 3.01c.; No. 9 galvanized wire, 3.30c.; No. 9 annealed wire, 2.80c.; No. 28 black sheets, 4.40c.; No. 28 galvanized sheets, 5.40c.; No. 10 blue annealed sheets, 3.70c. to 3.76c.; hoops and bands, 3.71c.; cold-rolled rounds, 3.75c.; flats, squares and hexagons, 4.25c.

Sheets.—Sheet prices have eased up and several independent mills are now quoting the American Sheet & Tin Plate Co.'s schedule of 3.35c. for black and 4.35c. for galvanized. There is no evidence that independent mills are meeting the Steel Corporation on blue annealed sheets, the usual quotations on that grade being 2.60c. to 2.70c. The demand for sheets has fallen off and many of the mills are able to make fairly prompt deliveries.

Reinforcing Bars.—Prices on hard steel bars are easier in sympathy with the soft steel bar market and 2c. is the usual quotation for car lots. The Ohio Public Service Co. has placed an order of 175 tons for a power house in Lorain, Ohio. Inquiries are pending from Louisville for 500 tons for a school building and the Elks Club house.

Old Material.—The weakness that prevailed in the scrap market for about two weeks has evidently disappeared, and the market is firm with virtually no changes in prices during the week. Little buying is reported by the mines, but some small purchases of heavy melting steel have been made for delivery in the Valley district at $21 to $21.25 and dealers report that they are offered $22 for choice material, for shipment to Warren. Compressed steel is quoted at $19.50 to $20 for Valley district shipment. A purchase of 2000 tons of heavy melting steel by a West Virginia consumer is reported at $18 to $18.50, this material to come from nearby towns. The Nickel Plate railroad received bids to-day on miscellaneous lists of about 1500 tons.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$18.75 to $19.25
Steel rails under 3 ft	21.00 to 21.25
Steel rails, rerolling	21.00 to 21.50
Iron rails	18.00 to 18.50
Iron car axles	26.00 to 27.00
Low phosphorus melting	20.00 to 20.50
Cast borings	15.00 to 15.25
Machine shop turnings	14.50 to 14.75
Mixed borings and short turnings	14.75 to 15.00
Compressed steel	17.00 to 17.25
Railroad wrought	18.00 to 18.50
Railroad malleable	20.00 to 21.00
Light bundled sheet stampings	13.75 to 14.00
Steel axle turnings	16.00 to 16.50
No. 1 cast	21.00 to 21.50
No. 1 busheling	12.50 to 13.50
Drop forge flashings over 10 in.	13.50 to 14.00
Drop forge flashings under 10 in.	14.00 to 14.50
Railroad grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Pipes and flues	13.75 to 14.00

Boston

Buffalo and Alabama Irons Weaker in Face of Drop in Business

BOSTON, Oct. 24.—Business in pig iron dropped to small proportions the past week, sales probably not exceeding 1,000 tons. Buffalo, Duluth and French iron displayed more life than other kinds. Weakness has developed in Buffalo iron where large tonnages are concerned, offers of No. 2X having been made at $30 furnace or $34.91 delivered, which represents a drop of about $1. One Alabama furnace, at least, is making lower quotations on 1922 and first quarter 1923 shipments, offers of $27.50 furnace or $1.50 less than previously quoted, having been made. Otherwise domestic iron prices show little variation. Eastern Pennsylvania furnaces are coming in slower than anticipated in New England. Sales the past week include Buffalo silicon 3.25 to 3.75, prompt shipment, at $35 furnace, and silicon 2.75 to 3.25 at $34 furnace. Scotch high silicon at $39.41 delivered Boston common rate point, and French silicon 2.50 to 3 at $28 c.i.f. Boston, duty paid, are included in transactions. Scotch iron usually is quoted at $31 and $33 for No. 3 and No. 1, respec-

tively; Continental silicon 2.50 to 3 at around $26.75 to $28 duty paid; and English $27 to $29 duty paid, same grade. During the week ending Oct. 21, 500 tons of pig iron arrived from England and approximately 4234 tons of Continental iron from Antwerp, most of the latter for unloading at New York, a grand total of 4734 tons, contrasted with 14,750 tons during the previous week.

We quote delivered prices, on the basis of the latest reported sales, now infrequent, and as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$35.65 to $37.65
East. Penn., sil. 1.75 to 2.25	34.65 to 36.65
Buffalo, sil. 2.25 to 2.75	34.91 to 36.41
Buffalo, sil. 1.75 to 2.25	34.91 to 35.91
Alabama, sil. 2.25 to 2.75	37.60
Alabama, sil. 1.75 to 2.25	37.10
Virginia, sil. 2.25 to 2.75	38.92
Virginia, sil. 1.75 to 2.25	37.92

Ferromanganese.—Buying of ferromanganese in small lots is active in this territory. Material running 76 to 80 per cent ground is selling on a pound basis equivalent to $110 to $115 per ton and higher for small lots.

Finished Material.—Round tonnages of bars were placed in this territory the past week, aggregate sales running well up into five figures. Prices are firm notwithstanding reported softness elsewhere. Small tonnages of sheets were placed and business in tool steels showed improvement. Structural steel is quiet. Total sales of finished materials in this territory, however, were somewhat larger than those for the previous week.

Cast Iron Pipe.—The cast iron pipe market is more active than it has been before in some time. Although many inquiries are tentative, prospects are beginning to take definite shape. On Monday next the city of Boston will open bids on 1200 tons of 12-in. and 16-in. high pressure pipe for early spring delivery. The Metropolitan (Massachusetts) District Commission has awarded 500 tons of 30-in. pipe to the Warren Foundry & Pipe Co. The market here for 6-in. pipe and larger is $59.10 delivered common Boston rate points, and for 4-in., $64.10. The usual $4 differential applies to class A and gas pipe.

Warehouse Business.—The movement of iron and steel out of warehouses is just about holding its own, being on a par with that last month, but below August. Stocks are in good condition and prices steady and unchanged. Blacksmiths' supplies are in better demand, especially axles, springs and toe calks, and heavy chain also is selling better. The expected advance in bolts and nuts has not materialized. Shipments of nails into this territory have increased, but are absorbed as fast as they arrive, consequently there is no accumulation of stocks.

Jobbers quote: Soft steel bars, $3.25 per 100 lb. base; flats, $3.85; concrete bars, 3.16½c.; structural steel, $3.25 to $3.50; tire steel, $4.50 to $4.85; open-hearth spring steel, $5 to $6.50; crucible spring steel, $12; steel bands, $4.25; hoop steel, $4.75; cold rolled steel, $4 to $4.50; refined iron, $3.25; best refined iron, $4.50; Wayne iron, $5.50; Norway iron, $6.60 to $7.10; plates, 3.16½c. to $3.35; No. 10 blue annealed sheets, $4.15 per 100 lb. base; No. 28 black sheets, $5.40; No. 28 galvanized sheets, $6.40.

Coke.—Interest in fuel centers in by-product foundry coke for first half contract shipment. The Providence Gas Co. announces it is sold up on such business. Bookings by that and the New England Coal & Coke Co. aggregate 65,000 to 70,000 tons, with the latter company still accepting business. Prices for such coke are either subject to those ruling date of shipment or ruling the first of the month prior to shipment. Both companies have caught up with 1922 contract shipments, the ruling price being $16.50 delivered within the $3.10 freight zone, consequently the $19.50 spot market is largely nominal. Shipments of Alabama foundry coke into this territory have been suspended, temporarily at least. English foundry coke is available at about local fuel prices, but in limited supply due to previous heavy sales to gas companies and other large consumers as well as to retail coal dealers.

Old Material.—New business in old materials has dropped to small proportions, due to congestion at Pennsylvania steel mills, heretofore active buyers in this territory. It is largely limited to heavy melting steel for Pittsburgh district consumers, usually at around $15 to $15.50 on cars shipping point; mixed borings and turnings for a West Virginia account at $12 and $12.50, although $11.75 has been done; and pipe for eastern Pennsylvania consumption, mostly at $11.50, with an occasional car lot at $11.65. Small tonnages of heavy melting steel for eastern Pennsylvania account have been purchased at around $13.50 on car shipping point. Chemical borings have been picked up at $19, shipping point. The scarcity of this material and the willingness of certain consumers to pay premiums is confusing in arriving at a price basis. Here the market apparently is $18 to $19, yet $19.75 on cars, Providence, R. I., has been turned down. Forged scrap at $11.50 on cars, shipping point, several cars of shafting at $19 to $19.50 for New England consumption, and small lots of horseshoes at $15, also for New England account, are included in the week's business. Buying against old contracts continues, but on a modified scale. Machinery cast, stove plate and malleable business is limited, New England melters still being able to supply wants from local or nearby junk yards.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$22.00 to $23.00
No. 2 machinery cast	20.00 to 21.00
Stove plate	17.50 to 18.00
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$13.50 to $15.50
No. 1 railroad wrought	16.00 to 16.50
No. 1 yard wrought	14.00 to 14.50
Wrought pipe (1 in. diam., over 2 ft. long)	11.00 to 11.50
Machine shop turnings	12.00 to 12.50
Cast iron borings, rolling mill	14.00 to 14.50
Cast iron borings, chemical	18.00 to 19.00
Blast furnace borings and turnings	12.00 to 12.50
Forged scrap and bundled skeleton	11.00 to 11.50
Shafting	19.00 to 19.50
Street car axles	23.00 to 24.00
Street car wheels	18.00 to 19.50
Rails for rolling	16.50 to 17.00

Cincinnati

Southern Ohio Pig Iron Prices Decline $1—Market Dull

CINCINNATI, Oct. 24.—The market continues extremely dull, there being practically no inquiry before the trade, and sales to melters in this district consist principally of carload lots. The Louisville & Nashville Railroad will probably close to-day on 775 tons of various grades, and the Buick Motor Car Co. has taken bids on 1500 tons of silvery for last quarter shipment. An Indiana malleable shop is inquiring for 200 tons. The largest sale reported was for 1000 tons of Chicago foundry iron to a Kentucky melter at an unnamed price, although it is reported that it was at least $1 under the market. A Detroit stove manufacturer bought 500 tons of Southern foundry iron at $27, base, Birmingham. Prices on southern Ohio iron are off about $1 a ton, and November and December shipments can now be booked at $31, furnace. In the South the price holds firmly at $27, with 50c. differentials for each 50 points of silicon. Some furnaces are quoting $28 to $28.50 with $1 differentials, but are selling practically all of their production to pipe shops in the South. A few small tonnages of Southern iron are reported to have been sold for first quarter delivery at $27.50. Production of pig iron will be considerably increased in southern Ohio about Nov. 1. Marting furnace has contracted for coke for three months' run on foundry and malleable grades, and Globe and Star silvery furnaces, having purchased coke, expect to blow in about Nov. 10. The Kelly furnace will probably go in on Bessemer. The second Columbus stack of the Amer-

ican Rolling Mill Co. blew in Monday, and No. 2 Ashland is expected to resume, following relining, early in November.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	31.55
Ohio silvery (nominal), 8 per cent	43.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	33.27
Basic Northern	32.27
Malleable	33.27

Finished Material.—Orders for finished materials were rather light during the week, being for the most part for carload lots for fill-in purposes. Prices are showing much firmness, although premiums for quick deliveries are no longer being secured. It is true that 2.25c. is still being done on bars and plates, but only in small lots. On orders running 100 tons and over, the usual price is 2.10c. to 2.15c. for four to six weeks' delivery, while for rather indefinite delivery 2c. can be done. Sheet mills report a fair volume of small orders, and deliveries are much better. This is probably due to the fact that most independent mills had not committed their entire tonnage for last quarter. From some mills sheets are now available in three to four weeks. Prices, however, show little change, the range being from 2.60c. to 2.75c. on blue annealed, 3.50c. to 3.65c. on black, and 4.50c. to 4.75c. on galvanized. Independent mills report some pretty fair tin plate specifications during the past week, and fourth quarter business will be fully up to the customary standard. Prices have not been named for next year, but announcements are expected about the first of November. The leading interest has withdrawn from the market on coated tin mill products. The range on structural shapes is 2c. to 2.10c., depending on delivery, with the market showing a little more activity. Nails are in heavy demand, due principally to the fact that shipments from mills are away behind. This condition applies to all wire products, with the exception of fence, the demand for which is light. Steel pipe mills generally have advanced prices $4 per ton, and the situation shows little change, mills being from two to three months behind in deliveries. Light rails are in better demand, with prices of 2c. to 2.25c. being quoted. Some activity has developed in concrete reinforcing bars. Bids will close on Oct. 28 on approximately 500 tons for the Brotherhood of Railway Clerks' office building in Cincinnati. An office building, exclusively for doctors, taking about 700 tons, will be up about Nov. 1. A number of smaller projects, involving an aggregate of 500 tons, are up for bids. The Brown Hotel, Louisville, a 15-story structure, will be up about Nov. 10. This will be a reinforced concrete structure. In the structural field several projects aggregating about 2500 tons will shortly be awarded. Railroad buying of bolts and nuts, spikes, fire box steel, boiler tubes and plates has been fair. The Cincinnati Car Co. has been awarded 100 steel passenger cars by the Chicago Elevated Railroad Co.

Warehouse Business.—Local jobbers report business good. Wire products, in particular, are in demand, there being an actual shortage of nails. Plates and shapes for immediate shipment are also much sought. Prices are very firm, and on plain wire local jobbers have made an advance of $2 per ton, the present quotation being $3.10 per 100 lb.

Cincinnati jobbers quote: Iron and steel bars, 2.95c. base; reinforcing bars, 3.05c. base; hoops, 4.05c. base; bands, 3.85c. base; shapes and plates, 3.05c. base; cold-rolled rounds, 3.75c. base; cold-rolled flats, squares and hexagons, 4.25c. base; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, $3.10 per 100 lb.; common wire nails, $3.20 per keg, base.

Coke.—There is fair activity in the coke market, furnace coke in particular being in demand. We note one sale of approximately 18,000 tons, one of 5000, and several of 1000 for last quarter shipments. Prices are easier, particularly on Connellsville which is being offered at $8 on furnace and $10.50 on foundry. Wise County furnace is quoted at $8 to $8.50, and foundry at $11.50. Pocahontas is quoted at $13 for foundry, and New River foundry as unchanged at $13 to $15. By-product quotations range from $11 to $12, ovens.

Old Material.—Probably in sympathy with the pig iron market, the scrap market is very dull, there being no demand for foundry grades. A little activity is noted in heavy melting steel and blast furnace grades. The L. & N. closed a list of 16,000 tons last week. Prices, if anything, show a softer trend, but in the absence of trading remain as last quoted.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$13.00 to $14.50
Iron rails	17.00 to 18.00
Relaying rails, 50 lb. and up	26.50 to 27.00
Rails for rolling	18.50 to 19.00
Heavy melting steel	17.50 to 18.50
Steel rails for melting	16.00 to 17.00
Car wheels	20.00 to 21.00
Per Net Ton	
No. 1 railroad wrought	14.50 to 15.00
Cast borings	11.50 to 12.00
Steel turnings	10.50 to 11.00
Railroad cast	18.00 to 19.00
No. 1 machinery	21.00 to 21.50
Burnt scrap	12.00 to 12.50
Iron axles	20.50 to 21.00
Locomotive tires (smooth inside)	14.50 to 15.50
Pipes and flues	9.00 to 9.50

St. Louis

Pig Iron Prices Untested in a Dull Market —Scrap Softer

ST. LOUIS, Oct. 24.

Pig Iron.—The outstanding feature of the pig iron market is the continued indifference of melters to future requirements. No effort of consequence is being made to buy for first or second quarter delivery. Melters are interested only in their immediate needs, and are buying largely in quantities of a carload up to 150 tons. Despite this indifference the furnaces are still quoting on the basis of $32, Chicago, for Northern iron, and $28 to $28.50, Birmingham, for Southern make for future delivery, although some resale iron has been sold on the basis of $31, Chicago. The light buying is what is holding the market at unchanged prices, makers feeling that as long as purchases are made in small lots for immediate shipment there is no need to shade prices. If any considerable tonnage was sought it was believed that a lower price might be made in an effort to land the business. The St. Louis Coke & Chemical Co. reports the sale of 3000 tons of foundry iron to an Ohio melter for prompt shipment and scattering orders aggregating 500 tons. Melters are eager to get shipments of orders already placed. A slightly better all-rail movement from the Birmingham district is reported.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25	$33.16 to $34.16
Northern malleable, sil. 1.75 to 2.25	33.16 to 34.16
Basic	33.16 to 34.16
Southern foundry, sil. 1.75 to 2.25	33.17 to 35.17

Finished Iron and Steel.—Jobbers are buying nails, wire and bars, and are needing the material, as is shown by the fact that they are placing their orders where the quickest shipments can be guaranteed. Fabricators report a dearth of inquiries, and there is very little business pending. All are busy now, but they are looking for orders. No railroad inquiries were sent out during the week. The Illinois Highway Commission is in the market for 50 tons of reinforcing bars for highway work.

For stock out of warehouse we quote: Soft steel bars, 2.90c. per lb.; iron bars, 2.90c.; structural shapes, 3c.; tank plates, 3c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 3.90c.; structural rivets, 3.60c. per 100 lb.; boiler rivets, 3.70c.; tank rivets, ⅞ in. and smaller, 55 per cent off list; machine bolts, large, 50 per cent; smaller, 50 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 55 per cent; hot pressed nuts, square or hexagon blank, $2.75; and tapped, $2.75 off list.

Coke.—The demand for coke continues far in excess of the supply. The best grades of Connellsville coke are going at $15 at the ovens, with some of the lesser known grades selling at $13. Terre Haute (Ind.) ovens are offering their coke at $16 ovens. The Granite City producer is still quoting $14, ovens.

Old Material.—The old material market is softer. Especial weakness is shown in rails for rolling, the mills in this district having enough to take care of their requirements for the remainder of the year. Material

sold in May, June and July, which has been tied up on account of the rail strike, is coming in faster than the mills can absorb it. The American Car & Foundry Co. made some purchases of rolling mill grades during the week. Rails for relaying are in good demand in 60 lb. and 80 lb. for lumber mills, coal mines and other industrial plants. The Louisville & Nashville Railroad sold about 15,000 tons, 11,000 going East.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$21.00 to $21.50
Rails for rolling	20.00 to 20.50
Steel rails, less than 3 ft	21.50 to 22.00
Relaying rails, standard section	26.00 to 29.00
Cast iron car wheels	24.00 to 24.50
Heavy melting steel	17.00 to 17.50
Heavy shoveling steel	16.50 to 17.00
Frogs, switches and guards cut apart	19.50 to 20.00
Per Net Ton	
Heavy axles and tire turnings	11.50 to 12.00
Steel angle bars	17.00 to 17.50
Iron car axles	27.50 to 28.00
Steel car axles	20.50 to 21.00
Wrought iron bars and transoms	23.00 to 23.50
No. 1 railroad wrought	17.00 to 17.50
No. 2 railroad wrought	16.25 to 16.75
Railroad springs	21.00 to 21.50
Steel couplers and knuckles	21.00 to 21.50
Cast iron borings	11.00 to 11.50
No. 1 busheling	14.25 to 14.75
No. 1 railroad cast	19.00 to 19.50
No. 1 machinery cast	20.00 to 20.50
Railroad malleable	20.25 to 20.75
Machine shop turnings	9.50 to 10.00

Birmingham

Pig Iron Prices Receding—New Rail Orders—Soil Pipe Reduced

BIRMINGHAM, ALA., Oct. 24.—What the real base of Birmingham iron was at the close of last week was not clear even to the makers. One large producer quotes $27.50 to $28. No maker was asking more than $28.50. Talk of $30 iron has ceased. Talk of $27 iron has entered and it is understood that one producer opened for that price in competitive territory without causing any particular buying. Trading was at a low ebb. The soil pipe people are understood to have given notice that they will not buy at present base, but will run the risk of using all iron on yards and getting along in the near future. There is little or no inquiry for 1923 and it is agreed that the present base will not apply to that delivery in the present psychological state. About Oct. 15, 3000 to 4000 tons was sold to a Southern pipe maker at approximately $28 and one maker is authority for the statement that he sold 1000 tons for the rest of the year in Southern territory on a base of $28.50 early last week. The larger tonnage was for delivery in the first quarter of next year. Three has been no repetition of that size of transaction. A representative of the leading interest was inclined to believe that the market had receded to $27 for really desirable business. The usual transaction last week involved a small tonnage in the South and was at $28 to $28.50. The Sloss-Sheffield Steel & Iron Co. has blown out No. 3 furnace at North Birmingham for minor repairs, which will take several weeks. Four furnaces remain active. Delivery of northern Alabama iron by way of the Tennessee River and Metropolis, thence by the Burlington railroad to Western points, is at the rate of around 10,000 to 12,000 tons a month. The stove and radiator plant melt is at a new maximum and Southern melt at large is giving an excellent account of itself. One furnace interest reports moving its make of pig iron this month so far.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$27.00 to $27.50
Basic	27.50 to 28.00
Charcoal, warm blast	33.00 to 34.00

Finishing Mills.—Full turn at the finishing mills of the Tennessee company for some time seems assured. New rail orders include 30 000 tons for the Atlantic Coast Line, 13,000 for the Nashville, Chattanooga & St. Louis Railway, 15,000 for the Texas & Pacific Railroad and 3000 for the Louisiana Railway & Navigation Co. The Southern railway's order for first half of 1923 includes 30,000 tons of 100-lb. rails and the Southern Pacific has ordered 30,000 tons. The new orders booked by the Chickasaw Shipbuilding & Car Co. include 1000 hopper cars for the Frisco and 200 cars for the Tennessee company. Hoop and band mills are on full turn with some very good export business in sight. The American Steel & Wire Co. and the Gulf States Steel Co. remain on very good turn in finishing mills.

Cast Iron Pipe.—The soil pipe market is dull and prices have dropped from $60 and $65 a ton to $50 and $55. Pressure pipe is firm at $43 and plants have orders sufficient to keep them on full turn for some time to come. The United States Cast Iron Pipe & Foundry Co. is understood to be completing details of price schedule and the like preparatory to placing the De Lavaud pipe on the market.

Coal and Coke.—Alabama coal operators have agreed on a maximum of $3.45 to $6 for domestic coal at mines. Production averages about 345,000 tons a week. Coke is firm at $8.50 to $10. The city of Boston has taken 2300 tons of Sloss-Sheffield Steel & Iron Co.'s coke, which will move by ship out of Charleston.

Old Material.—The scrap market is fairly active and would be more so but for the continued car shortage. The present price schedule is firmly maintained and all materials are moving well. We quote per gross ton f.o.b. Birmingham district yards as follows:

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$16.00 to $17.00
No. 1 steel	14.00 to 16.00
No. 1 cast	18.00 to 20.00
Car wheels	18.00 to 20.00
Tramcar wheels	17.00 to 19.00
Stove plate	16.00 to 17.00
Cast-iron borings	9.00 to 10.00
Machine shop turnings	9.00 to 10.00

San Francisco

Lack of Freight Space and Advance in Freight Rates Factors in Pig Iron Market

SAN FRANCISCO, Oct. 18.—The difficulty of securing adequate freight space on steamers calling at English and Continental ports is having a tendency to limit new business in foreign pig iron on the Pacific Coast. Water freights, moreover, have been raised recently, which is reflected in higher prices, a condition aggravated by the new duty, which has resulted in buyers adopting a conservative attitude, and covering their immediate needs only. It appears that there is a disposition to await lower prices on domestic material and a decline in water rates. At present, even at higher levels, foreign iron undersells domestic very considerably, making competition impossible. During the past two weeks, about 1000 tons of mixed English and Continental pig iron has been sold at about $30 to about $33, ex-ship, coast ports, the latter figure applying to high-grade iron and that which is sold on liberal terms. The acute shortage of open cars on the Pacific slope, due to lack of westbound movement, is having a disconcerting effect on deliveries of both pig iron and coke.

Cast Iron Pipe.—The pipe trade at this time is not very active, especially on heavy water pipe. Both private and municipal business is unusually light. Some prospects, however, are in sight, one sizable tonnage of 24-in. from Los Angeles coming up soon, and one from Lakeport of about 1000 tons, which has been delayed owing to some defection in the bond issue.

Old Material.—Firmness prevails in the scrap market, and stocks of desirable materials are rather hard to find. Japanese buyers who were looking around a short time ago did not accumulate very much. Current prices are ruling practically unchanged at from $12.50 to about $13 for heavy melting, delivered at buyer's plant, and from $25 to around $27 for cast iron scrap. Business is no more than routine.

Philadelphia

Pig Iron and Scrap Weaker—Finished Steel at Last Week's Levels

PHILADELPHIA, Oct. 24.—There has been no change in steel prices within the past week, except that plates, shapes and bars are more generally quoted at 2c., Pittsburgh. Pig iron is about $1 a ton lower for foundry grades, with indications that Eastern furnaces might go even lower on desirable tonnages to compete with the prices quoted on imported iron. Some scrap prices are also slightly lower than a week ago.

Shipments of steel from the Pittsburgh district to Eastern consumers are delayed by shortage of cars and the workings of the permit system now in force on the Pennsylvania Railroad, but Eastern mills are having little trouble. Apparently steel consumers are not suffering from lack of steel. Most of the pressure for deliveries comes from those having low-priced contracts. A large jobber reports that its "rush shipment" orders have fallen off in the past week or two, indicating that users of steel are fairly well supplied by the mills in spite of transportation handicaps.

Pig Iron.—With coke prices declining, with several furnaces in the East and Virginia ready to blow in soon, and with imported iron coming to Atlantic ports so freely as fairly to flood the market with offerings, it is not surprising that the past week should have brought further softening in pig iron prices. Foundry iron is off at least $1 a ton from last week's published quotations, making the present market $30, furnace, for No. 2 plain and $31, furnace, for No. 2X. There are indications that buyers of 500 tons or more for delivery over the remainder of this year would be able to cover as low as $29, furnace, for No. 2 plain. A week ago the lowest-priced offerings were made by steel companies, but since then merchant furnaces have also reduced their prices to $30, base. One or two steel companies find it as profitable to sell iron at an average price of $30 as to sell plates, shapes or bars at $40 per net ton, Pittsburgh. The Alan Wood Iron & Steel Co. has opened its books for first quarter pig iron contracts, quoting $31 for No. 2 plain and $32 for No. 2X, f.o.b. furnace. Buyers seem little interested in future requirements at the moment, and practically all of the current business, which is small in volume, is for prompt shipment. The decline in price of blast furnace coke is encouraging two or more operators of Eastern furnaces to put their stacks in blast and announcement of their decision is expected this week. One of these furnaces has 30,000 tons of unfilled orders on its books. An Eastern steel company is in the market for 10,000 to 15,000 tons of basic for November shipment and an Eastern subsidiary of the Steel Corporation has been anxious to buy basic if immediate delivery could be promised, as its regular supply from furnaces in the Pittsburgh district has been delayed by car shortage. None of this business had been closed up to to-day, and it seemed likely that furnaces would quote around $29 or $30, furnace, basic being slightly stronger than foundry iron, as there has been little competition in basic from foreign furnaces. A sale of upward of 1000 tons of basic was made last week at $30, furnace. Foreign foundry iron is offered at prices ranging from $27 to $30, c.i.f. Philadelphia, while imported low phosphorus iron, copper free, is now available at about $28, c.i.f. Philadelphia.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$31.14 to $32.14
East. Pa. No. 2X, 2.25 to 2.75 sil.	32.14 to 33.14
East. Pa. No. 1X	33.14 to 34.14
Virginia No. 2 plain, 1.75 to 2.25 sil.	37.17
Virginia No. 2X, 2.25 to 2.75 sil.	38.17
Basic delivered eastern Pa.	29.50 to 29.75
Gray forge	31.00 to 32.00
Malleable	34.00 to 35.00
Standard low phos. (f.o.b. furnace)	38.00 to 40.00
Copper bearing low phos. (f.o.b. furnace)	37.00 to 38.00

Ferroalloys.—While domestic makers of ferromanganese have had little or no opportunity to quote prices within the past few weeks, $100 per ton, furnace, would be quoted on inquiries. Foreign spiegeleisen is competing with domestic speigeleisen at $38 for either foreign or domestic, but little business is to be had.

Semi-Finished Steel.—Despite the decline in some finished steel prices, semi-finished steel remains high and firm. Open-hearth re-rolling billets are still quoted at $40 and forging billets at $45, Pittsburgh.

Plates.—A week ago, 2c., Pittsburgh, had been quoted by a few mills on some inquiries, but since then this price has become generally recognized as the market level, and with one or two exceptions all of the plate mills are now quoting 2c., Pittsburgh, on desirable lots of tank steel. For firebox or boiler steel some mills quote slightly higher. The Philadelphia & Reading business, about 900 tons, was divided between two mills which quoted 2c.

Bars.—While little new business in steel bars is coming to the mills their order books are in fairly good condition, independent mills having, as a rule, at least five or six weeks rollings ahead. To compete with steel bars makers of bar iron have reduced prices on that product and are now quoting 2c., Pittsburgh.

Wire Products.—The shortage of wire products is illustrated by the fact that one mill which is quoting $1 a ton above its competitors is having no difficulty in getting all of the business it cares to take.

Warehouse Business.—There is a fair demand upon jobbers for steel out of stock. Prices are unchanged and for local delivery

Coke.—A contract for furnace coke for delivery over the remainder of the year at $8, Connellsville, was under negotiation to-day and may be closed before the end of the week. This is a decline of $1 a ton within the week. Foundry coke is obtainable at $9 per ton, Connellsville. The coke situation is decidedly easier and the pig iron trade is predicting a decline to about $6 a ton.

Old Material.—The outstanding transaction of the week was the purchase of 10,000 or 12,000 tons of heavy breakable cast scrap and car wheels by an Eastern subsidiary of the Steel Corporation, which ran short of pig iron because of the car shortage, its supplies being shipped from the Pittsburgh district. For car wheels $23.50 per ton was paid. On cast the first price paid was $23, but this was dropped by degrees as purchases were made until the last buying was done at $20.50. The present market level for heavy breakable cast scrap, therefore, is slightly higher than a week ago as dealers in covering on their orders are paying at least $21, delivered. Railroad grate bars and stove plate are slightly stronger also, but otherwise the scrap market is weak and there are several declines in prices. No. 1 heavy melting steel is obtainable at $17.50 to $18, delivered at Eastern steel plants. No. 1 cast scrap for foundries is off $1 a ton.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$17.50 to $18.00
Scrap rails	17.50 to 18.00
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	25.50 to 26.00
Cast iron car wheels	22.50 to 23.50
No. 1 railroad wrought	22.00 to 23.00
No. 1 yard wrought	19.00 to 20.00
No. 1 forge fire	16.00 to 16.50
Bundled sheets (for steel works)	16.00 to 16.50
No. 1 busheling	15.50 to 16.00
Turnings (short shoveling grade for blast furnace use)	16.00 to 16.50
Mixed borings and turnings (for blast furnace use)	15.50 to 16.00
Machine shop turnings (for steel works use)	15.50 to 16.00
Machine-shop turnings (for rolling mill use)	15.50 to 16.00
Heavy axle turnings (or equivalent)	17.00 to 17.50
Cast borings (for steel works and rolling mills)	16.50 to 17.50
Cast borings (for chemical plants)	23.00 to 25.00
No. 1 cast	22.00 to 23.00
Heavy breakable cast (for steel plants)	21.00 to 22.00
Railroad grate bars	17.50 to 18.00
Stove plate (for steel plant use)	17.50 to 18.00
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	22.00 to 23.00
Steel axles	27.50 to 29.00

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....2.00c. to 2.25c.

Structural Material

Beams, channels, etc.....2.00c. to 2.10c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.00c. to 2.15c.
Refined iron bars, base, per lb.....2.60c.

Hot-Rolled Flats

Hoops, base, per lb.....2.90c. to 3.25c.
Bands, base, per lb.....2.90c. to 3.25c.
Strips, base, per lb.....2.90c. to 3.25c.
Cotton ties, per bundle of 45 lb.....$1.13

Cold-Finished Steels

Bars and shafting, base, per lb.....2.50c.
Strips, base, per lb.....4.50c.

Wire Products

Nails, base, per keg.....$2.70
Bright plain wire, base, per 100 lb..... 2.45
Annealed fence wire, base, per 100 lb..... 2.45
Galvanized wire, base, per 100 lb..... 2.95
Galvanized barbed, base, per 100 lb..... 3.35
Galvanized staples, base, per keg..... 3.35
Painted barbed wire, base, per 100 lb..... 3.00
Polished staples, base, per keg..... 3.00
Cement coated nails, base, per count keg..... 2.20
Woven fence, carloads (to jobbers).....70½ per cent off list
Woven fence, carloads (to retailers).....68 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads...60 and 5 per cent off list
Machine bolts, small, cut threads....50 and 10 per cent off list
Machine bolts, larger and longer....50 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads, 50, 10 and 5 per cent off list
Cut threads .....50 per cent off list
Longer and larger sizes.....50 per cent off list
Lag bolts .....60 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter.....45 per cent off list
Larger and longer sizes.....45 per cent off list
Hot pressed square or hex. blank nuts...$3.25 to $3.50 off list
Hot pressed nuts, tapped..... 3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, blank..... 3.25 to 3.50 off list
C.p.c. and t. sq. or hex. nuts, tapped..... 3.25 to 3.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S....75, 10 and 5 per cent off list
⅝ in. and larger, U. S. S.....70, 10 and 2½ per cent off list
Small sizes, S. A. E.....80 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75 and 5 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screw.....75 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....80 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.15
Large boiler rivets, base, per 100 lb..... 3.25
Small rivets .....65 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.75 to $2.85
Spikes, ½ in. and smaller, base, per 100 lb..... 3.50
Spikes, boat and barge, base, per 100 lb..... 3.50
Track bolts, base, per 100 lb..... 3.85 to 4.50
Tie plates, per 100 lb..... 2.35 to 2.50
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel			*Iron*		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	49	23½	¼ to ⅜.....	+7	+33
¼ to ⅜.....	55	29½	½	26	8
½	60	46½	¾	32	17
¾	64	52½	1 to 1½.....	34	19
1 to 3.....	66	54½			

Lap Weld

2	59	47½	2	29	15
2½ to 6.....	63	51½	2½ to 6.....	32½	19
7 to 8.....	60	47½	7 to 12.....	30	17
9 to 12.....	59	46½			

Butt Weld extra strong, plain ends

⅛	45	28½	¼ to ⅜.....+15		+48
¼ to ⅜.....	51	34½	½	25	13
½	57	46½	¾	32	18
¾	62	51½	1 to 1½.....	34	20
1 to 1½.....	64	53½			
2 to 3.....	65	54½			

Lap Weld, extra strong, plain ends

2	57	46½	2	30	17
2½ to 4.....	61	50½	2½ to 4.....	33	21
4½ to 6.....	60	49½	4½ to 6.....	32	20
7 to 8.....	56	43½	7 to 8.....	25	13
9 to 12.....	50	37½	9 to 12.....	20	8

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	21½	1½ in. .....+	7
2 to 2¼ in.....	36	1⅝ to 1⅞ in.....	3
2½ to 3 in.....	47	2 to 2¼ in.....	13
3¼ to 13 in.....	52	2½ to 3 in.....	18
		3¼ to 4½ in.....	20

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	57	2½ and 2¾ in.....	40
1¼ and 1½ in.....	49	3 in.	44
1¾ in.	33	3½ to 4 in.....	49
2 and 2¼ in.....	36	4½ in. and 5 in.....	41

Hot Rolled

3 in.	46	3½ to 4 in.....	51

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....85 per cent off list
Carbon 0.30 to 0.40, base.....83 per cent off list
Plus usual differentials and extras for cutting.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage.....	13	2¼-in. O.D. 10 gage....	17¾
2-in. O.D. 11 gage.....	14	3-in. O.D. 7 gage.....	33
2-in. O.D. 10 gage.....	15	1½-in. O.D. 9 gage.....	13
2¼-in. O.D. 12 gage....	15	5⅝-in. O.D. 9 gage.....	51
2¼-in. O.D. 11 gage....	16	5½-in. O.D. 9 gage.....	53

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C....$14.25	
8-lb. coating I. C....	9.60	30-lb. coating I. C....	15.25
15-lb. coating I. C....	11.80	35-lb. coating I. C....	16.25
20-lb. coating I. C....	13.00	40-lb. coating I. C....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.50c. to 2.85c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.35c. to 3.80c.

Galvanized

No. 28 (base), per lb.....4.35c. to 4.85c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.35c. to 3.75c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	$0.325	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic	0.315	Cleveland, Youngstown		Kansas City (pipe)	0.705
Baltimore, export	0.225	Comb.	0.19	St. Paul	0.595
New York, domestic	0.34	Detroit	0.295	Omaha	0.735
New York, export	0.255	Cincinnati	0.295	Omaha (pipe)	0.705
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.275
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215
				Pacific Coast	$1.50
				Pac. Coast, ship plates	1.20
				Birmingham	0.69
				Memphis	0.385
				Jacksonville, all rail	0.50
				Jacksonville, rail and water	0.415
				New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 30c. to 40c.; sheets and tin plates, 50c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 50c.; pipe, not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

RAILROAD EQUIPMENT BUYING

Fresh Inquiries Call for More Than 20,000 Freight Cars and 225 Locomotives

Fresh inquiries indicate all of 20,000 freight cars added to the railroad equipment now under negotiation and also 225 locomotives. With 125,000 cars already purchased this year, the week's developments look promising. Some of the items are as follows:

The Chicago, Milwaukee & St. Paul is inquiring for 2000 box, 3000 gondola and 1000 automobile cars, and may buy a total of 10,000 cars.

The Chicago, Rock Island & Pacific, which is in the market for 2500 cars, as announced last week, contemplates buying a total of 8000 cars.

The Northern Pacific is asking for figures on 3000 box cars.

The Pere Marquette, which is inquiring for 1500 automobile and 500 hopper cars, as announced last week, is also in the market for 500 gondola cars.

The Louisville & Nashville is inquiring for 2000 hopper and 1000 steel underframe box cars.

The Detroit, Toledo & Ironton has placed 500 steel hopper cars of 55 tons capacity with the Cambria Steel Co. and a like number with the Standard Steel Car Co., substantially as mentioned last week, the Ford Motor Co. being the buyer.

The Hocking Valley is inquiring for repairs on 1000 freight cars.

The American Short Line wants 50 gondola and 200 stock cars.

The Chicago, Milwaukee & St. Paul is inquiring for 100 Mikado type locomotives.

The Northern Pacific is in the market for 20 Mikado type, 20 Pacific type, 15 switch and 4 Mallet engines.

The Grand Trunk is inquiring for 5 eight-wheel switch engines.

The Chicago, St. Paul, Minneapolis & Omaha is in the market for 15 switch engines.

The Denver & Rio Grande is inquiring for 10 mountain type locomotives.

The Western Maryland has revived an inquiry for 10 consolidation type engines.

The Seaboard Air Line has placed orders for one locomotive each with the three locomotive builders. The latter are to work out the design of the type desired with their own engineering staffs and the builder which produces a locomotive most satisfactory to the railroad will be favored with an order for 22 additional engines of the same type.

The Virginian Railroad is in the market for 500 120-ton coal cars.

On bids opened by the Chicago & North Western on 800 ore cars, the Pullman Co. was low.

The Pennsylvania Equipment Co., Crozer Building, 1420 Chestnut Street, Philadelphia, is in the market for a number of 8000 and 6000-gal. tank cars for rental during the months of November, December and January, for the transportation of molasses, and it also desires to lease 100 tank cars for one year from Feb. 1, 1923, to be used for fuel oil. It is also in the market to purchase about 200 second-hand 100,000-lb. capacity flat bottom steel gondola cars, and one consolidation type locomotive weighing 100 tons.

The Chicago Elevated Railroads have purchased 100 new passenger cars from the Cincinnati Car Co.

FABRICATED STEEL BUSINESS

Fair Amount of Contracting But Slowing Up in Fresh Inquiries

Among the fabricated steel awards of the past week are the following:

New York Edison Co. building, Fifty-second Street, New York, 300 tons, to Hay Foundry & Iron Works.

Two apartment houses in New York, totaling 1000 tons, to A. E. Norton, Inc.

School building in Long Island City, 200 tons, to National Bridge Works.

Definite confirmation is now had of the letting of an apartment building on Park Avenue, 5000 tons, to Post & McCord, the American Bridge Co. furnishing the fabricated steel.

Metropolitan Life Insurance Co., model tenements in Queens, 800 tons, to R. Voras, Brooklyn.

The Bethlehem Steel Bridge Corporation was low bidder on car sheds for the Transit Commission on East 148th Street, New York, the tonnage being 3300 instead of 6000, as first announced.

The McClintic-Marshall Co. was low bidder on bridges for the Baltimore & Ohio Railroad, totaling 2500 tons.

American Steel & Wire Co. warehouse, Denver, Col., 587 tons, wood construction substituted.

Corn Products Refining Company, Plant Building, Argo, Ill., 400 tons, to Vierling Steel Works.

Patterson & Sargent Co. building, Chicago, 227 tons, to Brooks Co., Cleveland.

High School, Cedar Rapids, Iowa, 122 tons, to Rock Island Bridge & Iron Co.

Bridges and bridge repairs, Baltimore & Ohio Railroad, 2500 tons, to McClintic-Marshall Co.

Buckeye Commercial Savings Bank, Findlay, Ohio, 200 tons.

Oil tanks at Troy, Mont., and Whitefish, Mont., for Great Northern Railway Co., F. A. Bushnell, St. Paul, purchasing agent.

Structural Projects Pending

Inquiries for structural steel work now being figured on include the following:

Addition to the New York *Times* Annex, New York, 1500 tons.

Power house in Indiana to be erected by Stone & Webster, 2200 tons.

Missouri Pacific, one 80-ft. and two 60-ft. deck plate girder spans, 115 tons.

High school, Evansville, Ind., 250 tons, bids close Oct. 25.

Elks' Temple, Louisville, Ky., approximately 800 tons, bids close Nov. 1.

Mengel Body Co., Louisville, Ky., 200 tons, private plans.

Gymnasium, Ohio University, Athens, Ohio, 200 tons, bids in.

Louisville & Nashville freight station, Knoxville, Tenn., 250 tons, bids close Oct. 25.

Motor Company Additions

The Chevrolet Motor Co., Flint, Mich., and the Fisher Body Co. Corporation, Detroit, subsidiaries of the General Motors Corporation, have announced further expansion plans. The Samson Tractor Co.'s plant at Janesville, Wis., will be dismantled and remodeled for the Chevrolet and Fisher interests. Two large additions have been started, one providing 96,000 sq. ft. of floor space to be utilized by the Fisher Body Corporation, while the other new building will be used for assembling Chevrolet cars. The two new buildings will be ready for occupancy Jan. 1.

New Lukens Warehouse

The Lukens Steel Co., Coatesville, Pa., has acquired property at New Orleans, La., comprising a portion of the former shipyard of the Foundation Co., on the industrial canal, as a site for the erection of a new branch warehouse. The initial plant will consist of a four-unit structure, 75 x 250 ft., estimated to cost about $300,000, including equipment. At a later date, it is proposed to construct a fabricating plant at this location to replace the plant the company now operates at New Orleans.

Government Scrap Sold at Toledo

At the Government sale of scrap metals held at Toledo, Ohio, Oct. 23, 13,000 tons of shell forgings was sold at $20.89, Toledo, to Hickman, Williams & Co.; 2,000 tons of trench mortar forgings were sold to Samuels & Co., Brooklyn, at $16.77 and 7,000 tons of finished shell casings with copper bonds attached were sold at $23.06.

No bids were received for the plant and equipment of the Barney & Smith Car Co., offered at receiver's sale at Dayton, Ohio, Oct. 17. Negotiations are being carried on between the bondholders' committee and several large car manufacturing companies for the sale of the property, and it is expected that a deal will be completed within the next two or three weeks.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Oct.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
18.....	14.12½	13.62½	35.00	6.65	6.30	7.17½	6.82½
19.....	14.12½	13.62½	34.85	6.65	6.30	7.20	6.85
20.....	14.00	13.50	34.95	6.65	6.30	7.20	6.85
21.....	14.00	13.50	....	6.65	6.30	7.20	6.85
23.....	14.12½	13.62½	35.25	6.65	6.35	7.30	6.95
24.....	14.12½	13.62½	35.25	6.65	6.40	7.35	7.00

*Refinery quotation.

New York

NEW YORK, Oct. 24.

None of the markets is very active. In some the price tendency is higher and in others steady. Demand for electrolytic copper is fairly good and the market is steady after a slight reaction. Prices of both tin and zinc have advanced sharply on fairly good sales, but there is practically no change in the lead market.

Copper.—There have been persistent reports that electrolytic copper has been sold as low as 13.75c., delivered, in the past week, and a canvass of the market shows that some sales were made at this level the latter part of last week, but that at present practically no metal is available at less than 13.87½c., delivered, or 13.62½c., refinery. This represents the present market and metal at these prices is available from dealers and some small producers, but most of the large producers are either out of the market or not quoting less than 14c., delivered. Lake copper is generally quoted from 14c. to 14.25c., delivered. General demand is fair.

Tin.—Prices of Straits tin have advanced quite sharply in the past week on a fairly large turnover. As a result there has been considerable selling for profit, particularly by dealers, and there has been some buying in this market by London houses. The largest sales were made on Thursday, Oct. 20, when the total amounted to over 500 tons, part of this being bought by consumers and part by London houses, at a range of 34.62½c. to 35c. On that day metal for future shipment from the East was easy at 34.62½c. On both Friday and Saturday, Oct. 20 and 21, there was fair activity with dealers the principal buyers. On the New York Metal Exchange there were more transactions during the week than for some time. Yesterday and to-day the market has been very quiet with the quotation for spot Straits to-day at 35.25c., New York. The London market has continued to advance until to-day spot standard was quoted at £174 7s. 6d., future standard at £175 2s. 6d. and spot Straits at £175 10s., all about £5 per ton higher than a week ago. This is the principal cause of the advance in the New York market to a price higher than in many weeks. The extent of the advance here, however, in proportion to that in London, has been retarded partly because of a sharp decline in exchange. Arrivals thus far this month have been 5541 tons, with 7810 tons reported afloat.

Lead.—The lead market continues firm and steady, but fairly dull. Price changes are insignificant. Consumption is heavy, but there continues to be no spectacular demand and no pressure by producers to sell. The situation is a little stronger at St. Louis, where the outside market is now quoted at 6.40c., St. Louis. Quotations at New York are unchanged at 6.50c. for the leading interest and 6.65c. for the independents.

Zinc.—Prices for prime Western have advanced sharply until they have reached the highest levels for the year. Prime Western for early delivery is quoted at 7c. to 7.05c., St. Louis, or 7.35c. to 7.40c., New York, and sales have been made at the lower level. The market has advanced almost daily on moderate sales and demand from both galvanizers and brass makers is reported good. Besides the reduction in stocks and the difficulty in increasing production, due to the scarcity of labor, the sharp rise in the London market has been a factor in the advance. It is the general opinion that the British will have to come into the American market in the very near future for some of their supply of zinc.

Antimony.—Wholesale lots of Chinese metal for early delivery are quoted at 6.75c. per lb., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, made by foreign producers, is quoted by importers at 20c. to 21c. per lb., New York, duty paid, but public quotations of the leading American producer continue to be unobtainable.

Old Metals.—The market is quiet and trading is limited. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.375
Copper, heavy and wire	12.50
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.25
Brass light	6.50
No. 1 red brass or composition turnings	9.50
No. 1 yellow rod brass turnings	7.50
Lead, heavy	5.50
Lead, tea	4.00
Zinc	4.25

Chicago

Oct. 24.—Copper has declined, while tin and spelter have advanced. Tin has advanced through speculation. London purchases of tin in New York last week averaged 1000 tons a day. This unusual development is ascribable to an effort to run up the market. Copper has weakened following reports that a large producer had sold a considerable tonnage at a concession in price. Demand for zinc and lead is alternately good and bad, but the net result is a firm market. Some of the old metal grades have advanced in sympathy with new material. We quote, in carload lots, lake copper, 14.37½c.; tin, 36c. to 37c.; lead, 6.37½c.; spelter, 7c.; antimony, 8.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11.50c.; copper bottoms, 9.75c.; red brass, 9c.; yellow brass, 7c.; lead pipe, 4.87½c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 24c.; block tin, 29c., all buying prices for less than carload lots.

St. Louis

Oct. 24.—Lead for the week was firm at 6.35c., car lots, while slab zinc was firmer, up 15 points, at 6.80c. On old metals we quote: Light brass, 3.50c.; heavy red brass and light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 20c.; tea lead, 2c. and aluminum, 9c.

J. A. Fay & Egan Co. Buys Plant

The J. A. Fay & Egan Co., woodworking machinery manufacturer, Cincinnati, has purchased the plant of the Trailmobile Co. in the Oakley district, and will occupy it about Jan. 1. The Fay & Egan Co. had completed plans for a new factory in the Bond Hill section, but the completion of the deal for the Trailmobile plant will enable the company to move from its present plant, which has been sold to a warehousing syndicate, almost at once. The new plant will give the company 150,000 sq. ft. of floor space, against 200,000 at present occupied, but its modern construction will enable the company to utilize the smaller floor space to much better advantage. The Trailmobile plant was completed in 1919, and is one of the most modern industrial plants in the Middle West.

To Make Hoffmann Bearings in United States

The Norma Co. of America has acquired the American patents and business of the Hoffmann Mfg. Co., Chelmsford, Essex, England, maker of roller, ball and thrust bearings. The line of Norma precision ball bearings will now be supplemented with Hoffmann bearings. The Norma company, Anable Avenue, Long Island City, N. Y., will erect a new plant for the manufacture of Hoffmann products in America. Meantime they are being imported by the Norma company.

PERSONAL

John Calder, consulting engineer, Lexington, Mass., who has devoted the past three years to organizing and managing the industrial relations of Swift & Co. in its various plants in the United States and Canada, as central office from Chicago, will return to his practice in organization, management and industrial counsel on Nov. 1. Mr. Calder has been appointed industrial adviser to Swift & Co.

Joseph K. Larkin, president J. K. Larkin & Co., Inc., 253 Broadway, New York, recently celebrated the 30th anniversary of his connection with the iron and steel industry. In 1901 Mr. Larkin organized the firm of J. K. Larkin & Co., which, under his direction, has steadily grown, until it now ranks among the leading distributors of iron and steel products in the country. Mr. Larkin long has been a student of the metallurgy of iron and steel. He also attended New York Law School.

JOSEPH K. LARKIN

Several changes in the car works organization of the Pullman Co. were made necessary by the resignation of J. B. Weaver as vice-president. Peter Parke, chief engineer, while retaining that title, has been transferred to the economy and improvement department, where his duties will involve research and experimental work with regard to modern methods and machinery. E. W. Test, formerly of the Michigan City plant of the company, has taken over Mr. Parke's former duties with the title of general mechanical engineer. P. L. Randall becomes acting superintendent of car service, and J. K. Tully, who has been a special inspector in yard service, becomes assistant superintendent of yards.

Joseph B. Weaver has resigned as vice-president of the Pullman Co., an office which he has held since 1919. Previously he was vice-president and general manager of the Harlan & Hollingsworth plant of the Bethlehem Shipbuilding Co., Wilmington, Del., having gone to Wilmington from the Newport News Shipbuilding & Dry Dock Co., where he had been superintendent of hull construction. Mr. Weaver is a graduate of Cornell, class of 1902.

G. A. Richardson, advertising manager, Pittsburgh, of the Midvale Steel & Ordnance Co., showed that company's film, "The Process of Manufacturing Steel," before the students of Washington University and also the Associated Engineering Clubs at St. Louis He left that city for Texas, where the film will be shown at Marshall, Dallas, Forth Worth, Waco and San Antonio.

W. H. Phillippi, vice-president Lackawanna Bridge Works Corporation, a subsidiary of the Lackawanna Steel Co., and one of the properties recently taken over by the Bethlehem Steel Corporation, has resigned.

T. W. Harris, general foreman at the blast furnace of the St. Louis Coke & Chemical Co., Granite City, Ill., sailed from New York this week to become connected with the blast furnace staff of the India Iron & Steel Co. at Asansol, Bengal, India. He expects to arrive in India in time for the blowing in of the first 500-ton furnace, which has been under construction in the past year.

George D. Cameron has tendered his resignation, effective Jan. 1., as manager of the coal department of Pickands, Mather & Co., Cleveland, which he has held for a number of years.

Alfred D. Flinn has been elected director of the Engineering Foundation. This is the organization brought into being some years ago through the initial donation of a large sum of money by Ambrose Swasey for fostering organized industrial research on a nation-wide scale. Mr. Flinn, who is also secretary of the United Engineering Society, the organization which holds the Engineering Societies Building in New York, has retired as chairman of the engineering division of the National Research Council in order to accept the new appointment, but he will continue as secretary of the United Engineering Society, thus providing that the foundation will continue intimate relations with the so-called founder engineering societies.

Joseph E. Moore, for about 15 years identified with the New York office of the Bethlehem Steel Co., has been appointed structural steel sales agent of the company at Detroit, with headquarters in the Penobscot Building. The establishment in Detroit of a structural steel office marks a departure for the Bethlehem company.

O. R. Paine, who has been assistant to L. R. Stewart, manager of the structural sales department of Bethlehem Steel Co.'s Philadelphia office, has been appointed to have charge of the structural sales of the company's Baltimore office, Continental Building.

Edward T. Peterson, formerly with the Treadwell Engineering Co., Easton, Pa., has been appointed chief engineer of the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Horace C. Barker, formerly industrial engineer, Toledo Scale Co., Toledo, Ohio, has been appointed general manager for the General Radio Equipment Mfg. Co., Chicago.

Oliver Stubbs, who represented the Institution of British Foundrymen at the meeting in Rochester of the American Foundrymen's Association, has been elected senior vice-president of the institution as a step to provide for his re-election as president of the organization. He served as president last year and traveled 30,000 miles on institution work, a feat which he stated he was not prepared to do again, though willing to accept the office a second time and serve foundry interests in other ways.

Warren F. Fraser, president, has resumed the general management of the Warren F. Fraser Co., Westboro, Mass., automatic cylindrical grinders, metal products, etc. Sydney Player, formerly vice-president and general manager, and Joseph N. Bethel, formerly vice-president and sales manager, have formed a selling partnership under the firm name of the Bethel-Player Co., and will continue to sell the products of the Warren Fraser Co.

Frederick D. Dimmick, 501 Franklin Bank Building, Philadelphia, in addition to his own territory, has been appointed exclusive sales agent of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., in the New York district.

Jay L. Hench, formerly district sales manager of the Lackawanna Steel Co. at Chicago, has been appointed manager of sales, Hillside Fluor Spar Mines, Chicago, and is also to be vice-president and a member of the board of directors.

A. D. Fishel has been appointed Cleveland representative of the Mahr Mfg. Co., with offices at 1202 Illuminating Building, Cleveland.

Louis W. Byrne, formerly with Burton Griffiths & Co., Ltd., New York, has been appointed sales manager of Wilmarth & Morman Co., Grand Rapids, Mich., manufacturer of grinding machines, effective Nov. 1.

Homer D. Williams, president Carnegie Steel Co., has been appointed member of the Pittsburgh Board of Public Education. The appointment is for six years. Mr. Williams also is a member of the State Council of Education and a trustee of the University of Pittsburgh and the Carnegie Institute of Technology.

George Furman, until recently plant manager of the Chicago works, Niagara Radiator & Boiler Co., and formerly associated with Henry E. Pridmore, Chicago, has joined the sales force of Beardsley & Piper, Chicago, manufacturer of sand slinging machines.

R. H. Becker, formerly connected with the machine tool building and sales department of Joseph T. Ryerson & Son, is now with the Milwaukee Machinery Co., 93 West Water Street, Milwaukee. He will have charge of machine tool sales in part of the Milwaukee and in southern Wisconsin.

Kent Harrison, who for the past three years has been in charge of open hearth operations with the American Rolling Mill Co., Ashland, Ky., has resigned to become superintendent of open hearth operations of the Donner Steel Co., Buffalo, effective Nov. 1. He was trained in the mills of the Illinois Steel Co., and has done some good work both as operator and steel maker.

P. C. Idell, who has been connected with the engineering and sales department of the Babcock & Wilcox Co., 85 Liberty Street, New York, for 23 years, has been appointed manager of its New England office at 49 Federal Street, Boston.

D. K. Swartwout and Herman H. Lind have resigned as president and vice-president respectively of the Ohio Body & Blower Co., Cleveland. M. A. Middleton, Boston, has been elected president to succeed Mr. Swartwout.

OBITUARY

WILLIAM B. RHODES, director S. Severance Mfg. Co., Pittsburgh, who at one time was identified with the Pennsylvania Tube Works, founded by his father, Joshua Rhodes, now the Pennsylvania Works, National Tube Co., died Oct. 20, at the home of his sister, Mrs. H. N. Van Voorhis, Sewickley Heights, Pa. He was 59 years old.

LOUIS P. LINCOLN, superintendent of the beam-fitting department of the Homestead works, Carnegie Steel Co., fell dead while at work on the afternoon of Oct. 20. He was born Aug. 8, 1866, in Laurelton, Pa. and attended Dickinson College. During the past 10 years he had been burgess of Munhall, Pa.

JAMES A. KING, one of the organizers of the King Bridge Co., and for many years president of that company, died Oct. 19. He retired from active business several years ago, and had been an invalid for a number of years. Norman C. King, a son, is secretary-treasurer of the company.

L. A. BURRELL, Cincinnati representative of the Sharon Steel Hoop Co., died at his residence in that city on Oct. 17. He was born in Bellefonte, Pa., and was at one time a member of the State Legislature. He was 66 years old, and is survived by his wife and two daughters.

JOHN C. KRONER, president LaCrosse Steel Roofing & Corrugating Co., and of the Fred Kroner Hardware Co., LaCrosse, Wis., died suddenly on Oct. 18, in Atlantic City, N. J., while attending the national wholesale hardware convention. He was widely known as manufacturer and jobber of hardware and sheet metal goods. Mr. Kroner was 57 years of age and a native of LaCrosse.

CHARLES A. BRAYTON, president Standard Car Wheel Co., Cleveland, died suddenly on Oct. 15, having succumbed to heart trouble during the night. He was 47 years of age and had been connected with the company 20 years, becoming president after the death of his father who also had held that position. He was graduated from Yale University in 1899.

GERMAN PRICES ADVANCE AGAIN

Foundry Iron and Steel Figures Up 3 to 5 Per Cent in Week

(By Radiogram)

BERLIN, GERMANY, Oct. 23. — Foundry iron No. 1 has been raised from 38,099 m. (last week) to 40,176 m. per metric ton. (This represents $9.70 per gross ton, at 2⅝c. per 100 m.) Similar advances have been made in steel ingots, 59,470 m. ($14.35) in place of 57,640 m.; steel bars, 81,200 m. (0.94c. per lb.) in place of 78,700 m.; thin sheets, 25 gage, now 120,680 m. (1.40c. per lb.) in place of 116,970 m.

[In all of these cases the world price, expressed in dollars (or cents) is much lower than last week, due to the drop in exchange from 3½c. to 2⅝c. per 100 m. As shown on page 1021, Oct. 19, the translated prices a week ago were: foundry iron, $13.55; ingots, $20.50; bars, 1.25c. per lb., and sheets, 1.86c. per lb. The table on that page gives figures for these four products, covering the principal changes of the past seven months.]

Wheeling District Steel Plant Operations Increase

WHEELING, W. VA., Oct. 23.—Operations in local plants show some increase. The Laughlin plant, American Sheet & Tin Plate Co., Martins Ferry, has 20 of the 23 mills working. Three additional tin mills have gone on at the Creek plant of Whitaker-Glessner Co. The top furnace, Wheeling Steel & Iron Co. has gone into blast. Operating schedules for the week follows:

Wheeling Steel Corporation

Wheeling Steel & Iron Co.: Benwood plant, 65 per cent; Belmont plant, 65 per cent; Top mill furnace, operating; Yorkville plant, 50 per cent.

Whitaker-Glessner Co.: Wheeling mills, 100 per cent; Martins Ferry mills, 80 per cent; Beech Bottom plant, 100 per cent; Wheeling Can department, 75 per cent; Portsmouth plant, 85 per cent.

LaBelle Iron Works: Steubenville plant, 75 per cent; Wheeling plant, 95 per cent.

United States Steel Corporation

National Tube Co.: Riverside plant, Benwood, idle.

American Sheet & Tin Plate Co.: Laughlin plant, Martins Ferry, 87 per cent; LaBelle plant, Wheeling, idle; Aetna-Standard, Bridgeport, Ohio, idle.

Carnegie Steel Co.: Bellaire plant, idle; Mingo Junction, two of four blast furnaces in blast and sheet bar mills running full.

Persistent Reports of Wage Advances Nov. 1 Not Credited in Pittsburgh

PITTSBURGH, Oct. 23.—A further increase in steel mill wages, to become effective Nov. 1, is common gossip here, but actual confirmation that any on the companies will make an increase is not to be obtained. Reports have reached here from the East to the effect that independent companies would advance wages of common labor 10 per cent, but investigation among the leading companies brings forth the statement that no action yet has been taken. It is admitted, however, that common labor wage scales here are unattractive by comparison with those paid in other industries and that there is still a marked shortage of this class of help.

Provision for Open Top Cars

WASHINGTON, Oct. 24.—Effective yesterday, by an amendment to service order No. 25, made public last Wednesday, the Interstate Commerce Commission made provision for the supply and distribution of open-top cars suitable for the loading and carrying of coal to wagon mines and it also added foundry sand and materials for car and locomotive construction or repair to the list of commodities which may be loaded in open-top cars in the direction of, but not beyond, the mine or mines to which the open-top cars are destined for coal loading. The addition of these products will help the iron and steel, foundry and lumber trades particularly.

British Iron and Steel Market

America Still Inquiring for Pig Iron—Tin Plate Price Agreement Signed by 93 Per Cent of the Makers

(By Cable)

LONDON, ENGLAND, Oct. 24.

While there is still a moderate American demand for pig iron, other export buying is slow, owing to high prices. Fuel is still advancing and increased production of pig iron at present is unlikely. America is buying on the East Coast and Welsh hematite makers' stocks are now practically cleared. Prices are firmer.

Finished iron and steel generally is quiet, with quotations unaltered. The Indian Government is inquiring for 92 locomotives.

There is fair demand for Continental iron and steel, owing to the depreciation of money exchanges, but the works generally are firm and are not keen to reduce prices. Continental merchant bars are offered at £6 16s. (1.35c. per lb.) f.o.b.; sheet bars at £6 7½s. to £6 10s. (1.26c. to 1.29c. per lb.) c.i.f. Wales. German billets are quoted at £5 10s. ($24.42) f.o.b.

Tin plate demand is affected by the price agreement, but some business is being done at the new figures. There is good inquiry from Scandinavia, Australia, Canada and India, but Japan is quiet. Ninety-three per cent of the tin plate makers have agreed to maintain the minimum price. Welsh tin plate bar makers will sell bars at £7 ($31.08) delivered to these tin plate works, but charge £7 7½s. ($32.75) to tin plate works outside the agreement.

There is improved demand for galvanized sheets. Prices are firmer on dearer spelter. Small business is being done with South Africa, South America, Australia, China and the Straits Settlements.

Black sheet makers have fixed minimum prices for Japanese specifications. Good business is passing at the old prices and a moderate amount of inquiry continues.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.44 per £1, as follows:

Durham coke, delivered	£1	11s.		$6.88	
Cleveland No. 1 foundry	4	17½		21.64	
Cleveland No. 3 foundry	4	12½	to £4 15s.	20.53 to	$21.09
Cleveland No. 4 foundry	4	10		19.98	
Cleveland No. 4 forge..	4	5		18.87	
Cleveland basic	4	0		17.76	
East Coast mixed.....	4	12½	to 4 15	20.53 to	21.09
Ferromanganese	15	0		66.60	
Ferromanganese*	14	10	to 14 15	64.38 to	65.49
Rails, 60 lb. and up...	7	5	to 8 0	32.19 to	35.52
Billets	7	2½	to 8 0	31.63 to	35.52
Sheet and tin plate bars, Welsh	7	0	to 7 7½	31.08 to	32.75
Tin plates, base box...	0	19¼	to 0 19⅜	4.27 to	4.30
				C. per Lb.	
Ship plates	8	10	to 9 0	1.68 to	1.78
Boiler plates	11	10	to 12 0	2.28 to	2.38
Tees	9	0	to 9 10	1.78 to	1.88
Channels	8	5	to 8 15	1.63 to	1.73
Beams	8	5	to 8 15	1.63 to	1.73
Round bars, ¾ to 3 in.	9	0	to 9 10	1.78 to	1.88
Galvanized sheets, 24 g.	16	5	to 16 10	3.22 to	3.27
Black sheets, Japanese specifications	14	0	to 15 0	2.78 to	2.97
Steel hoops	11	0	& 11 10*	2.18 &	2.28*
Cold rolled steel strip, 20 g.	23	2½		4.58	
Cotton ties, Indian specifications	15	0		2.97	

*Export price.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:					
Belgium, Jan.	£4	5s	to £4 7½s.	$18.87 to	$19.42
Luxemburg, Jan. ...	4	5	to 4 7½	18.87 to	19.42
France, Jan.	4	5	to 4 7½	18.87 to	19.42
Billets:					
France, Dec.	5	12½	to 5 14½	24.97 to	25.41
Luxemburg, Dec. ...	5	12½	to 5 14½	24.97 to	25.41
Lorraine, Dec.	5	12½	to 5 14½	24.97 to	25.41
Wire nails (keg basis):					
Germany	0	14½		3.22	
Belgium	0	20½		4.55	
Wire rods, 5 mm. (0.2 in.):					
Belgium	7	5	to 10 7½	32.19 to	46.06
Angles:				C. per Lb.	
Belgium, Sept.	7	7½		1.46	
Tees:					
Belgium	£8	5s.		1.63c.	
Merchant bars:					
Belgium, Jan., Feb..	7	0	to £7 5s.	1.39 to	1.44c.
Luxemburg, Jan. ...	7	0	to 7 2½	1.39 to	1.41
France, Jan., Feb., Mar.	7	0	to 7 7½	1.39 to	1.46
Germany, Jan., Feb., Mar.	7	0	upward	1.39	
Joists (beams):					
France, Dec.	6	8	to 6 10	1.27 to	1.29
Belgium, Dec.	6	8	to 6 10	1.27 to	1.29
Luxemburg, Dec. ...	6	8	to 6 10	1.27 to	1.29
Channels:					
Belgium	7	10	to 7 12½	1.49 to	1.51
⅜-in. plates:					
Germany, Dec., Jan..	7	5	to 7 7½	1.44 to	1.46
Belgium, Dec.	7	7½	to 7 10	1.46 to	1.48
Luxemburg, Dec. ...	7	5	to 7 7½	1.44 to	1.46
France, not offered.					
⅛-in. plates:					
Germany	9	0		1.78	
No. 8 gage wire:					
Belgium	14	10⅝		2.88	

Preliminary Improvements at Lackawanna Plant

BUFFALO, Oct. 24.—Razing of old frame structures and the erection of steel and brick buildings, installation of sanitary facilities for the convenience of the men, and the improvement of railroad facilities essential to a better movement of freight both incoming and outgoing, are the first steps taken by the Bethlehem Steel Corporation in its process of improving the Lackawanna Steel plant recently acquired. Work has already been started and preliminary steps were inspected by President E. G. Grace and Vice-president Quincy Bent. Mr. Grace made his first official visit to the plant since it was taken over by the Bethlehem interests.

Water transportation for the movement of steel products and pig iron will be developed by the Bethlehem organization at Lackawanna. One of the first observations by Mr. Grace at the plant was that this facility had not been developed in proportion to the opportunities offered by reason of the natural advantages offered through lake and river connections.

The full program of improvements at the Lackawanna plant calls for the spending of over $15,000,000. The changes will be mainly in departments other than the rail mill. The new construction will include some additions to both blast furnace and coking plants. The company expects to be a continuing factor in the merchant pig iron market.

Detroit Scrap Declines

DETROIT, Oct. 24.—While there has been no decided decrease in the melting schedules of the Detroit and Michigan foundries, the scrap market has shown a slight decline on almost all materials. Producers have been forced to pile all grades of scrap which ordinarily would be moved to melting points, and car shortage is more acute than ever. The following prices are on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery scrap, which are quoted on a net ton basis:

Heavy melting steel	$16.00 to $16.50
Shoveling steel	16.00 to 17.00
No. 1 machinery cast	21.00 to 23.50
Cast borings	12.50 to 14.00
Automobile cast scrap	23.00 to 25.00
Stove plate	21.00 to 23.00
Hydraulic compressed	17.00 to 18.00
Car wheels	21.00 to 22.00

The Dodge scrap for November delivery, consisting of approximately 4000 tons of turnings, flashings, borings and hydraulic compressed, will be awarded the latter part of the month on a competitive basis.

Asking for Prices for Next Year

YOUNGSTOWN, O., Oct. 24—Steel buyers are beginning to ask the mills for prices to apply in the first quarter of next year. Makers are largely withholding quotations, but one interest says it expects to open its books about Dec. 1. Talk of a $37.50 sheet bar price for the first quarter is heard.

Though accumulated output due to car shortage is being cleared, one independent still has 7,000 tons of sheets piled.

BOOK REVIEWS

Health and Efficiency. By Thomas Darlington, M. D. Pages 262, 5¾ x 8¾ in. Published by Wynkoop, Hallenbeck, Crawford Co., New York. Price, $1.50.

Dr. Darlington is well known to the steel trade for his unstinted service as secretary of the welfare committee of the American Iron and Steel Institute. He has done much to give "welfare" work a better name in industry and to put it on a basis more enduring than mere sentiment or even self-interest could give it. All this because he brought to his industrial work a ripe experience in the practice of medicine and in the administration of laws safeguarding the public health.

In writing the book Dr. Darlington says that he aimed to give the reasons for the principles of physiology and to show their application to the human machine in every-day working and living conditions. He meant it as a contribution to the great conservation movement that must follow the war's riot of expenditure of time, money and lives. In all his effort in behalf of workers in iron and steel the author has stressed attention to the common details of care of the body and the necessity for periodic physical examinations. The surprise to physicians who have made many physical examinations of workmen of ordinary intelligence and education is not so much, he tells us, to find the large percentage of physical defects, but to find so few of those examined who had the faintest idea of having defects, or who were aware of their impaired physical condition.

In simple style and with no trace of professional pedantry in matter or manner, the results of Dr. Darlington's long experience are set down, and running through his whole counsel is the spirit of helpfulness and of optimism. The chapter headings are often single words, as Air, Food, Sleep, Exercise, Sunshine and Clothing. Getting Tired is the subject of an important chapter, recalling Dr. Darlington's iron and steel works addresses on fatigue. There are chapters also on Baths and Bathing, Drinking Water, Care of the Mouth and Teeth, and How to Avoid Disease of the Lungs. What is said and the manner of saying it indicate that back of the practitioner is one who would be known as a friend of man, one who would make a full appraisal of the value of faith, a well-ordered life and a right mental attitude in their relation to health and therapy. The book should have a widespread reading both among employers and employees.

The Journal of the Institute of Metals, Vol. XXVII, edited by G. Shaw Scott, Institute of Metals, 36 Victoria Street, London, S. W. 1, England, covers practical problems relating to the corrosion, protection and season cracking of condenser tubes, failure of aluminum alloys, recrystallization of cupro-nickel and other metals. The first 300 pages of the book are given over to these subjects. The volume concludes with an abstracts section containing several hundred concise summaries of metallurgical papers that have been published in all parts of the world. The list of names of papers abstracted covers 11 pages. The book may be obtained from Institute of Metals at the address given. The price is 31s. 6d. net.

NEW TRADE PUBLICATIONS

Steel Conveyors.—Sandvik Steel, Inc., 233 Broadway, New York. Catalog No. 18, 26 pages. Information is given on the application of the steel belt in conveying problems, also as to its efficiency and economy. Illustrations are supplemented with fractional views of various units in the construction.

Electric Railroads.—Bulletin No. 44016, General Electric Co., Schenectady, N. Y. The progress of steam railroad electrification is traced on numerous systems in Asia, Europe, and North and South America, telling of physical and mechanical problems encountered in modernizing private and public roads. Freely illustrated, showing various types of motors and dynamo rooms. Size, 20 pages, 10 x 12-in.

Boilers.—E. Keeler Co., Williamsport, Pa. Condensed bulletin giving detailed description and illustrations of the three types of Keeler boilers. It includes a comprehensive table of dimensions of all important sizes together with setting plans. Size, 20 pages, 6 x 9-in.

Power Tools.—Chicago Pneumatic Tool Co., 6 East Forty-fourth Street, New York. Special publication No. 686, illustrates and describes power operated tools, showing novel methods in their use.

Grinders and Buffs.—J. G. Blount Co., Everett, Mass. Small booklet describes and illustrates its line of ball-bearing motor grinders and motor buffs.

Digest of Patent Laws of the World.—Mida's Trade Mark and Patent Bureau, Ellsworth Building, Chicago. Bulletin No. 106 gives in four pages a brief digest of the patent laws of the world, showing the duration of life of the patent, the proper applicant, the limitation on filing, the tax period and the requirement as to working of patent. The digest covers 100 countries and colonies.

Pinion Rods and Cold Drawn Shapes.—A. B. & J. Rothbone, Palmer, Mass. In a 20-page catalog, 6 x 9 in., are illustrated some dozens of irregular shapes made in aluminum, brass, phosphor and tobin bronze, German silver, etc., for a great variety of purposes. These are used in watches and clocks, typewriters, adding, calculating, multigraphing and motion picture machines, carbureters, magnetos and small motors, cameras, telegraph instruments, telephones, vacuum cleaners, locks, dental apparatus, firearms and a great variety of other machines and instruments.

All in a Day's Work.—Osborn Mfg. Co., Cleveland. In a 16-page pamphlet, featuring molding machines, are shown various types of castings made and patterns for use with molding machines. Data are given of the Osborn roll-over jolt molding machine, various dimensions, weights and figures for capacity being tabulated.

Ballard-Sprague Construction Service.—Ballard-Sprague & Co., 200 Fifth Avenue, New York. A 20-page pamphlet, 6 x 9, devoted to specialized construction service in boiler settings and chimneys, together with special work in the line of bridge pier foundations and concrete buildings. The pamphlet describes the building of radial brick chimneys, and shows, among other things, reinforced concrete acid towers. Tables are given showing the sizes of chimneys fitted to various boiler powers and giving the maximum intensity of chimney draft for various chimney heights and gas temperatures.

Alloy Steels.—The Central Steel Co., Massillon, Ohio. Booklet of 44 pages, giving a brief story of the evolution of the alloy steel industry. Lists many parts for which alloy steels are used, and calls attention to the various qualities that have led to the adoption of certain alloy steels for specified products. Numerous charts are included giving chemical and physical characteristics of many most generally used alloy steels. Specifications are also given of some of the special alloy steels made by this company.

Chilled Iron Wire Drawing Dies and Hard Iron Castings.—McFarland Foundry & Machinery Co., Trenton, N. J. A 4-page circular devoted to dies for wire drawing, varying from those with 1 hole to those with 16 holes, the range is 26 sizes, going as small as No. 25 B. & S. gage and weighing from 4 oz. to 37 lb. Special shapes also are made in hard cast iron in a variety of patterns.

Combustion Device.—Crown Fuel Saver Co., Richmond, Ind., Earl F. Whitaker, agent, 30 Church Street, New York. Illustrated circular describing a device for introducing supplementary air for combustion immediately above the fuel bed of coal-burning furnaces.

Tile.—The Carborundum Co., 50 Church Street, New York. Catalog, describing and illustrating various conditions under which anti-slip tile may be used to give a lasting resistance on walking surfaces, indoors and out. A specification guide for placing or repairing tile floors is included. Size, 22 pages, 9 x 5 in.

Machinery Markets and News of the Works

RAILROADS STILL INQUIRE

Chicago & Northwestern Issues List of 19 Tools

Other Purchases Small, But a Fair Volume of Machine-Tool Business Is in Prospect

Railroad business continues to dominate the machine-tool situation. The Pennsylvania Railroad, Central Region, has inquired for 10 tools. A large list from the same road for its Columbus, Ohio, shops has been expected at Cleveland, but it is stated that it probably will not be issued until the first of the year. No action has yet been taken on the 80 tools inquired for by the Eastern division of the road.

At Chicago the Chicago & Northwestern Railroad has issued an inquiry for 19 tools, which is regarded as a forerunner of a larger list. The St. Louis-Southwestern has an inquiry out for a half dozen machines and the Santa Fe has added a few tools to its recent purchases. The Rock Island has bought one tool within the past week and is in the market for two others.

At Pittsburgh the Pittsburgh & Lake Erie Railroad is inquiring for seven tools. The Missouri-Kansas-Texas Railroad has placed a few orders with Cincinnati builders. Included in the recent orders of the Baldwin Locomotive Works, Philadelphia, were 10 planers, which will be furnished by a Cincinnati machine-tool company. The Ramapo Iron Works, Hillburn, N. Y., is reported to have bought 12 planers.

In the East the principal buying of the past week has been done by the General Electric Co., Schenectady, [illegible] which is rounding out tool purchases begun several weeks ago.

Among prospective buyers of machinery, mostly woodworking, is the Mengel Body Co., Louisville, Ky., which is expected to buy a complete line of machines for a body-building plant.

A few price advances have taken place within the past week notably one of 15 per cent by a leading manufacturer of drilling machines.

New York

NEW YORK, Oct. 24.

EACH week brings a slight improvement in machine-tool buying in the Eastern district, but the volume still falls far short of being satisfactory. Aside from the General Electric Co. there are few companies in the East that are buying on a liberal scale. The General Electric Co.'s purchases have been spread out over several weeks, further orders having been placed within the past week. The Crucible Steel Co. of America, which is doing locomotive repair work at its Harrison, N. J., works has bought a 96-in., 600-ton wheel press and a 90-in. driving wheel lathe. The New York Central Railroad has bought a 100-ton bushing press and the Atlantic Coast Line has bought a 43-in. rod miller. These items cover the more important buying of the week.

The Transit Commission, New York, will build large shops on E. 148th Street, New York, for the Interborough Rapid Transit Co., which the latter will equip, most of the machinery having been purchased some time ago, but a few odds and ends will probably be required when the new shops are completed.

Quietness rules in sales of cranes and new inquiries, with the exception of locomotive cranes, inquiry for which is reported to be active. Fewer used locomotive cranes are said to be in evidence. Several of the large capacity overhead crane orders are still pending but are expected to close shortly. Among these is the inquiry of the Phoenix Utility Co., New York, which has been current for several weeks, and one from the Central Railroad of New Jersey, calling for a 25-ton, 4-motor crane for Perth Amboy. Fay, Spofford & Thorndyke, Boston, consulting engineers, who are handling a contract for a warehouse, expects to be in the market soon for equipment. The Bureau of Supplies and Accounts, Washington, D. C., will open bids at 10 a. m., Nov. 14, on a 5-ton, single I beam, hand power crane for use by the Navy Department at the radio station power house, Mount Tenjo, Cal.

Among recent sales are:

Anaconda Copper Mining Co., 25 Broadway, New York, two 10-ton electric traveling cranes from the Shaw Electric Crane Co.

Pennsylvania Railroad, a 25-ton, 58-ft. span, gantry crane with 10-ton auxiliary for Indianapolis, from the Champion Engineering Co.

Imperial Government Railways, Japan, two 20-ton, 40-ft. boom, crane pile-drivers through an exporter in New York, from the Industrial Works. This makes a total of six crane pile-drivers purchased recently by this railroad.

New York Central & Hudson River Railroad, three used Orton & Steinbrenner locomotive cranes from the General Equipment Co., New York.

American Smelting & Refining Co., New York, a 30-ton used Orton & Steinbrenner locomotive crane from the Lord Construction Co., Weehawken, N. J., for use at Maurer, N. J.

Raymond Concrete Pile Co., New York, a 30-ton locomotive crane for use at St. Louis, from the McMyler-Interstate Co.

Gaynor & Rosenbloom, Brooklyn, N. Y., a 5-ton, 30-ft. span hand power crane from an unnamed builder.

Durant Motors Co., New York, seven pneumatic hoists for the Elizabeth assembling plant, Elizabeth, N. J.

Berry Iron & Steel Co., St. Joseph, Mo., a 5-ton, 58-ft. span, 3-motor overhead traveling crane from the Bedford Foundry & Machine Co., through the Miles Machinery Co., Saginaw, Mich.

The Unit Ventilation Co., College Point, L. I., manufacturer of ventilating equipment, is taking bids for a one-story addition to its plant on Second Avenue, 50 x 100 ft., estimated to cost $30,000. Paul H. MacNeil, 154 Nassau Street, New York, is architect.

The C. M. Sorensen Co., 177 East Eighty-seventh Street, New York, manufacturer of electric air compressors, parts, etc., has plans nearing completion for the construction of a three-story factory, 40 x 75 ft., on Radde Stand Hunter Avenue, Long Island City, to cost $60,000.

The S.O.S. Welding Corporation, 235 Sixth Street, Brooklyn, will install a traveling crane and other equipment at its plant.

Power equipment, conveying apparatus, disposal machinery and other mechanical equipment will be installed in the two-story incinerating plant, 70 x 100 ft., to be erected by the Bureau of Street Cleaning, Borough of Queens, Huntington, L. I., estimated to cost $200,000, for which bids will be asked around Nov. 15. Joseph P. Powers, Rockaway Beach, L. I., is architect.

The American Locomotive Co., 30 Church Street, New York, has awarded a contract to the McClintic-Marshall Co., Oliver Building, Pittsburgh, for a new one-story erecting shop at its plant at Schenectady, N. Y.

Lathes, milling machines, drill presses, screw machines and other machine tools, electrical equipment, etc., will be offered for sale by the Air Service Bureau, War Department, Washington, at the air service depot, Long Island City, N. Y., on Nov. 14.

Motors, controlling devices and other electric power and mechanical equipment, conveying machinery, etc., will be installed in the new six-story printing and publishing plant, 83 x 110 ft., to be erected by the Brooklyn Daily Eagle, Eagle Building, Brooklyn.

The Robbins & Myers Co., 30 Church Street, New York, manufacturer of fans, motors, etc., with plant at Springfield, Ohio, has issued bonds for $3,000,000, a portion of the proceeds to be used for extensions, additional working capital, etc.

A complete automobile machine and repair works will be installed in a portion of the new six-story industrial building to be constructed by the Queens Subway Loft Building Corporation, Long Island City, at Hunters Point and Skillman Avenues, for which site, 440 x 520 ft., has been acquired. The shop will be equipped primarily for motor truck service. The industrial building will aggregate more than 500,000 sq. ft., and will be leased to outside interests. It is estimated to cost in excess of $600,000, including power house and other mechanical branches.

The State Hospital Commission, room 1046, 25 Broadway, New York, will receive bids until Oct. 31 for the construction and installation of an electric lighting plant at the Brooklyn State Hospital, Creedmoor, Queens, L. I., in connection with the erection of other buildings. Plans and specifications at the office of L. F. Pilcher, Capitol Building, Albany, N. Y.

The W. H. Hughes Co., 507 West Thirty-fifth Street, New York, manufacturer of lacquers, enamels, etc., has acquired the entire building at 164 Coit Street, Irvington, N. J., heretofore held by the Pierce, Butler & Pierce Mfg. Co., New York, for a new plant. Immediate possession will be taken.

The Public Service Production Co., Public Service Terminal, Newark, a subsidiary of the Public Service Corporation, operating electric and railway utilities, is concluding negotiations for the purchase of the recently completed plant of the Day-Elder Motors Corporation at Clinton Avenue and Twenty-first Street, Irvington, for $350,000. The structure is four-stories, 75 x 250 ft., and will be equipped for miscellaneous operating service; the first floor will be used for a complete machine and repair shop to handle about 500 motor trucks and cars operated by the company. It is proposed to equip the top floor as a testing laboratory. The Day-Elder company has abandoned plans to use the building for motor truck manufacture, as initially projected, and will continue operations at its present works on Coit Street.

The Crane Co., 84 Mechanic Street, Newark, manufacturer of valves, steam specialties, etc., with headquarters at 836 South Michigan Avenue, Chicago, has leased a one-story building to be constructed on Tremont Street, Jersey City, to cost about $50,000, for a new branch.

The Zenith Mfg. Co., 23 Marshall Street, Newark, formerly known as the Zenith Tool Co., has purchased a new two-story factory, 50 x 150 ft., at 290 Chestnut Street, and will concentrate operations at this point for the manufacture of talking machine parts and equipment. The company recently acquired the Cirota Talking Machine Co., High Street, to merge with its present organization.

The Gilby Wire Co., 690 Summer Avenue, Newark, N. J., manufacturer of fine brass wire, etc., has leased property at 108 Adams Street, totaling about 8000 sq. ft. for a new plant.

Burrell G. White, Munsey Building, Baltimore, manufacturer of refrigerating equipment, has leased the one-story building at 238-40 Astor Street, Newark, comprising about 6000 sq. ft. of floor space, for the establishment of a new plant.

The Torsion Test Piston Ring Co., Roselle, N. J., has leased property at 112 Adams Street, Newark, N. J., for a new branch plant.

W. A. Fouchy, 15 Broad Street, New York, is inquiring for a used vertical boring mill, capacity between 60 in. and 84 in. between centers.

F. H. Crawford, 299 Broadway, New York, is inquiring for the following used machines: No. 0, No. 1 or No. 2 bulldozer, Williams-White or equivalent; several No. 6 and No. 57 Toledo or Bliss presses; double-end shear, preferably with slitting shear blade at one end and long bar shear blade at other end, capacity for ⅜ in. high carbon plate 36 in. wide; 25-ton hydraulic wheel press; 8-in. pipe machine.

Catalogs Wanted

S. N. Mistri & Co., engineers, contractors and manufacturers' agents, 139 Daripur, Rupapari Pole, Ahmedabad, India, request American manufacturers to send catalogs, pamphlets, etc., of engineering products and automobiles.

Chicago

CHICAGO, OCT. 23.

UNEXPECTED delays have resulted in further postponement of the closing of the Burlington lists. The Chicago and Northwestern has issued an inquiry comprising 19 items which is regarded as the forerunner of an extensive list. The St. Louis-Southwestern is inquiring for a 42-in. boring mill, a 36-in. horizontal boring mill, a 6-in. centering machine, two emery stands and a cutter and reamer grinder, all motor driven. The Santa Fe has entered the market for a 20-in. upright drill press and an improved Yankee belt-driven single end dry drill grinder with point thinning attachment, style J. B. point, and an inquiry has been received here from the Norfolk & Western for two 8-ft. plain radial drills. The Rock Island has placed an order for a 24-in. crank planer, but is still in the market for a carwheel boring machine and a bulldozer. Local machine tool houses find general trade less active and believe that if October sales totaled prove to be as large as those of September, it will be because of railroad orders rather than business from miscellaneous users.

No further price changes have been announced outside of a general adjustment by the Canedy-Otto Mfg. Co., Chicago Heights, which puts its radial drills up about five per cent and decreases upright drills approximately the same percentage.

The Chicago & Northwestern list is as follows:

Two 18-in. engine lathes, 4 ft. between centers.
Two 20-in engine lathes, 6 ft. between centers.
Two 30-in. crank planers.
One 42-in. drill press.
Three power hack saws, Marvel No. 4, or equivalent.
One 15-in. drill press.
Three double dry grinding emery wheel stands with 2 x 18-in. wheels and 1¾-in. arbors.
One spot welding machine, equal to No. 254 Thompson Welder Co. machine to weld No. 22 to No. 3 B. & S. gage iron and steel.
One large quick work power hammer with set of dies.
One centering machine to center 3-in. stock.
Two hollow hexagon turret lathes, Warner & Swasey No. 2-A universal, or equivalent.
All of these machines are to be quoted including motors.

The Stephens-Adamson Mfg. Co., Aurora, Ill., is inquiring for a gear hobber to cut gears up to 1½ d.p. and to 72-in. p.d., a small friction saw for cutting steel bars and shapes, a combination punch and coping machine, a 1½-in. capacity heavy duty hand screw machine, a 2-in. capacity heavy duty screw machine and one horizontal boring machine, capacity of 10-in. bore, length 60 in., with 24-in. space from table to center when former is in lowered position, with side adjustment to be equipped with boring bars and out-bored bearing.

The National Supply Co., Toledo, Ohio, is inquiring for a 42-in. or a 52-in. vertical boring mill with one head.

The Chicago, Rock Island & Pacific has placed a 200-ton transfer table with the Whiting Corporation.

The Shepard Electric Crane & Hoist Co. recently booked the following orders: A 2-ton electric hoist and back-geared motor for the Mississippi Valley Structural Steel Co., St. Louis; a 2-motor 5-ton hoist for the Chesapeake & Ohio, Peru, Ind., shop; a 1-ton hoist for the Ford Motor Co., Detroit, two 2-ton hoists for the Jeffrey Mfg. Co., Columbus, Ohio, and a 1-ton hoist for the Central Malleable Castings Co., Chicago.

The Raymond Brothers Impact Pulverizer Co., 1319 North Branch Street, Chicago, has purchased a tract, 200 x 250 ft., adjoining its plant, which will be used for expansion.

The Chicago Steel & Wire Co. is receiving bids through L. G. Hallberg & Co., 116 South Michigan Avenue, Chicago, on a one-story addition, 30 x 112 ft., at West 103rd Street and Hoyne Avenue, to cost $15,000.

The Imperial Box Co., Inc., 1506 Carroll Avenue, Chicago, will have constructed by Holton, Seelye & Co., a one-story addition, 70 x 115 ft., to cost $27,000.

The International Harvester Co., 606 South Michigan Avenue, Chicago, will build a one-story plant, 120 x 180 ft., at 2600 West Thirty-first Boulevard, to cost $60,000.

The Mercury Mfg. Co., manufacturer of storage battery trucks and automobile trucks, 4118 South Halsted Street, Chicago, has let contract for a one-story addition, 60 x 100 ft., to cost $12,000.

Huguelet Brothers, 903 Gary Street, Chicago, have had

plans prepared for a third story reinforced concrete addition, 58 x 190 ft., to cost $50,000.

The Innes Shocker Co. has started the erection of the first unit of a plant at Bettendorf, Iowa, for the manufacture of grain shockers. It will be 60 x 140 ft.

The machine shop of the Automatic Gravel Products Co., Muscatine, Iowa, a building 20 x 40 ft., was recently destroyed by fire with an estimated loss of $15,000.

The General Die Casting & Machine Co., 2533 North Ashland Avenue, Chicago, recently incorporated, has taken over the business of the General Die Casting Co. of the same address. An addition to the plant is under way to provide increased facilities for production and to take care of larger business.

The Sinclair Refining Co., 111 West Washington Street, Chicago, will soon take bids for a new mill, 70 x 116 ft., at Olmstead, Ill., estimated to cost $75,000. The installation will include pulverizing, sorting, conveying and other machinery.

A refrigerating and cold storage plant will be installed in the five-story meat-packing plant to be erected by the Mountain States Packing Co., Union Stock Yards, Denver, Col., to be 200 x 400 ft., and estimated to cost about $2,000,000. All machinery will be electrically operated.

The Northern Pacific Railroad Co., Fifth and Jackson Streets, St. Paul, Minn., will build an addition to its locomotive repair shops at Jamestown, N. D., including engine house, shops, etc., estimated to cost $150,000.

C. W. Lamphere, Gilmore, Iowa, is preparing for the erection of a new one-story and basement ice-manufacturing plant, 70 x 100 ft., estimated to cost $50,000, including equipment. A similar plant is also contemplated in the vicinity of Clarion, Iowa.

The Central Power Co., Grand Island, Neb., will commence work on a new steam-operated, electric generating plant, with initial capacity of about 5000 kw. estimated to cost approximately $750,000.

The Kohrs Packing Co., 1343 West Second Street, Davenport, Iowa, will erect a two-story ice and refrigerating plant, 64 x 75 ft., estimated to cost $60,000.

The Middle West Utilities Co., 72 West Adams Street, Chicago, will commence the construction of a new steam-operated electric power plant on the Mississippi River, near Grand Tower, Ill., to have an initial capacity of 25,000 kw., estimated to cost $5,000,000. Later, additions will be made bringing the cost to more than $10,000,000.

The Common Council, Spencer, Iowa, has authorized the completion of plans for a one-story municipal electric power plant to cost $25,000. W. C. Barton, 1221 Forty-third Street, Des Moines, is architect.

The Sioux City Gas & Electric Co., Sioux City, Iowa, has disposed of a bond issue of $3,500,000, a portion of the proceeds to be used for extensions in electric power plants and system.

Rudow Brothers, Morris, Ill., have commenced the erection of a two-story shop, 60 x 84 ft., for machine and welding work. It will cost about $22,000.

Philadelphia

PHILADELPHIA, Oct. 23.

THE George B. Clopp Iron Works, 3717 Filbert Street, Philadelphia, has awarded contract to Barclay White & Co., 1713 Sansom Street, for a new five-story plant at 910-14 Cherry Street, to cost $100,000.

The Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., is in the market for a No. 6, or larger, Becker vertical milling machine, suitable for die sinking.

A one-story power house will be constructed at the plant of the Mifflin Chemical Co., Delaware and Mifflin Avenues, Philadelphia.

Hugh F. Munro, 1737 North Fifth Street, Philadelphia, operating a sheet-metal working plant, is said to be arranging a list of equipment for installation at his proposed two-story and basement plant, 50 x 60 ft., at 1745-51 Bodine Street.

The plant and property of the Wright Roller Bearing Co., Twentieth Street and Indiana Avenue, Philadelphia, including a two-story factory, 61 x 270 ft., machine tools, power equipment, etc., will be sold on Nov. 9, by the receivers, Harry W. Champion and W. B. Stratton.

The Nash Motor Co., 901 North Broad Street, Philadelphia, has awarded contract to the Turner Construction Co., 1713 Sansom Street, for a five-story and basement automobile service and repair building, 75 x 160 ft., estimated to cost $300,000.

The Department of Public Safety, 1328 Race Street, Philadelphia, is planning for the purchase of a 1-ton cable hoist, electrically operated.

A. B. Stem, R. Van Horn and F. W. Woodcock, care of James Collins Jones, Bullitt Building, Philadelphia, representative, have organized a number of light and power companies to operate in various townships. Electric power plants and systems will be installed. Application for a State charter will be made on Nov. 20.

Fire, Oct. 20, destroyed a portion of the paper mill of the Jeperson Newsprint Co., South Union Street, Lambertville, N. J., with loss estimated at $300,000, including machinery. The plant was formerly held by the Perseverance Paper Co., and has recently been acquired, remodeled and reopened by the Jeperson Co. It is planned to rebuild. Henry Weeks is general manager.

Motors, conveying equipment and general machinery, valued at close to $75,000, at the plant of J. Eavenson & Sons, Inc., Penn Street and the Delaware River, Camden, N. J., manufacturer of soap products, were destroyed by fire, Oct. 20. The entire loss is estimated at $200,000. It is planned to rebuild.

The Hillside Coal & Iron Co., Pittston, Pa., has plans in progress for a new coal breaker at its Butler Colliery, estimated to cost close to $100,000, including machinery.

Ovens, electric power equipment, conveying machinery and other mechanical equipment will be installed in the new eight-story plant, 150 x 250 ft., to be erected at Glenwood Avenue and Broad Street, Philadelphia, by the National Biscuit Co., New York. A. G. Zimmerman, 85 Ninth Avenue, New York, is architect.

The Pressweld Products Co., Ellwood City, Pa., recently organized, has acquired the local plant of the Pennsylvania Iron & Steel Products Co., for the manufacture of iron and steel specialties. A portion of the equipment has also been taken over.

The Williamsport Wire Rope Co., Williamsport, Pa., has completed plans for a one-story addition, 80 x 140 ft., to cost $14,000, exclusive of equipment.

The Pennsylvania Power & Light Co., Allentown, Pa., will enlarge its electric generating plant at Hauto, Pa., with installation to include a 20,000 kw. generator and auxiliary machinery. Details are being arranged for taking over the property of the Lycoming-Edison Co., Williamsport, Pa., and affiliated interests about Nov. 16. Extensions are planned in the latter works.

The Advance Rumley Co., Laporte, Ind., manufacturer of agricultural implements and equipment, has plans nearing completion for new branch assembling and distributing works on South Cameron Street, Harrisburg, Pa., to be 100 x 150 ft., and estimated to cost $100,000, including equipment. F. G. Fahnestock, Jr., Harrisburg, is architect.

The International Chain & Mfg. Co., York, Pa., has been organized under State laws and has acquired the plant of the Victoria Chain Co. George J. Campbell is president, and Richard L. Hunt, treasurer.

The Fleck-Marshall Co., Lancaster, Pa., manufacturer of pipe, plumbing equipment, etc., has tentative plans for a two-story foundry and machine shop at the plant of the Rothfuss-Howard Iron Works, Williamsport, Pa., lately acquired for a branch factory. The company is affiliated with the Fleck Brothers Co., 50 North Fifth Street, Philadelphia, manufacturer of similar equipment. John G. Fleck is president.

A power house will be constructed by the Stauffer Chemical Co., 624 California Street, San Francisco, Cal., in connection with its proposed new Eastern plant at Chester, Pa., where site of 10 acres has recently been secured, estimated to cost $500,000.

Fire, Oct. 18, destroyed a portion of the foundry of the Extension Radiator Works, Huntingdon, Pa., with loss estimated at $25,000. It is planned to rebuild. The plant is operated by the Pierce, Butler & Pierce Mfg. Corporation, Syracuse, N. Y.

The Pioneer Grinding & Machine Co., Allentown, Pa., has been organized to take over and operate the general machine works at 844 North Seventh Street, heretofore conducted under the name of Dugan & Young. The new company plans expansion. It will be headed by John C. Young, a member of the former organization, and Henry J. Wallis, who has acquired the Dugan interest.

Fire, Oct. 13, destroyed the repair shops and yard property of the Central Railroad of New Jersey at Ashley Plane, near Wilkes-Barre, Pa., with loss estimated at $200,000, including equipment.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, has plans in progress for the electrification of its system from Altoona to Johnstown, Pa., to include the construction of a main generating plant, with a number of smaller electric power houses. The entire project is estimated to cost in excess of $12,000,000. A. C. Shand is chief engineer.

The Ellwood Steel Co., Ellwood City, Pa., has acquired the local plant formerly occupied by the Sharon Pressed

Steel Co. Improvements will be made and equipment installed for the manufacture of a general line of steel products.

The Board of Mercer County Freeholders, Trenton, N. J., will take bids until Oct. 31, for 75,000 pounds of machinery, cable, sheaves and other equipment, to be used in connection with the erection of a new steel, lift-span, wire-rope type, viaduct over the Delaware & Raritan Canal, and Pennsylvania Railroad, Olden Avenue. Charles H. Reichert is director, department of bridges. Plans and specifications at the office of the County Engineer, Trenton Court House, and at J. A. L. Waddell, 35 Nassau Street, New York, engineer.

Henry A. Hitner's Sons Co., 4501 Richmond Street, Philadelphia, is in the market for two used air compressors, belt driven; capacity 500 cu. ft. each, 100 lb. steam pressure or better; 220 or 440 volt, two-phase.

G. William, 828 North Hancock Street, Philadelphia, is inquiring for small Landis pipe threading machines, used but in good condition; also lots of galvanized electrical conduit.

Catalogs Wanted

The Ideal Dust Conveyor Co., Williamsport, Pa., desires catalogs, price lists, etc., on pipe strapping, galvanized steel sheets, ash can handles, hinges, door latches.

New England

BOSTON, Oct. 23.

SALES were spotty the past week, a majority of machine tool houses, notably manufacturers' representatives, reporting no business of importance, while a few did fairly well on one, two and three tool lots. The largest individual transaction the past week involved three new engine lathes, the heaviest 20 in., a used plain grinding machine, a used drill press and six small used bench tools to a Greater Boston concern. A two-spindle high speed drill press and a hack saw, purchased by the Massachusetts Institute of Technology, is representative of the average importance of new tool business. Two or three school lists are out but are unimportant. The largest live prospect is a woolen goods manufacturer, who has issued a moderately large machine shop list and is expected to close shortly. In this case tools are specified, thus competition is eliminated. Several prospects heretofore considered active have either been abandoned or put over into the first quarter of 1923. The purchase of a new 32-in. shaper and an 18-in. lathe by the Portland Terminal Co., Portland, Me., represents the last business up with New England carrier interests.

The recent advance in new tool prices so far has failed to stimulate buying to any degree. On the other hand, it has made for a somewhat larger inquiry for used equipment and going business is chiefly in this field. Used machine tool houses, for the first time in months, are buying quite freely for stock. One Boston house is negotiating for a large amount of equipment and is expected to shortly make an announcement regarding this.

Crane prospects have dwindled to one 5-ton or one 10-ton crane wanted by a Vermont scale manufacturer.

The International Paper Box Machinery Co., Nashua, N. H., wants a used planer type slab milling machine to take 30 in. between housings, with a 12 ft. to 14 ft. table. The machine must have two vertical spindles and a side head, if possible.

The Superintendent of Lighthouses, Portland, Me., is in the market for two oil compressor units for operating fog signals.

The Lever Brothers Co., 176 Broadway, Cambridge, Mass., is considering the erection of a turbine building. No date has been set for bids to close.

Large drop hammers and miscellaneous other shop and foundry equipment will be sold at public auction by the trustees in bankruptcy of the Harley Co., Page Boulevard, Springfield, Mass.

Work has been started on the foundations and superstructure for the first two units, 160 x 360 ft. of the new Boston Elevated Railway Co. machine shops at Everett, Mass.

Plans have been filed by the Spartan Saw Works, Springfield, Mass., for a factory to be erected at a cost of $14,000.

The S. A. Woods Machine Co., 17-19 Damrell Street, Boston, will build a one-story addition.

The Edison Electric Illuminating Co., 70 State Street, Boston, is arranging for a stock issue of $5,406,700, a portion of the proceeds to be used for new power plant construction, extensions, etc.

The Universal Gold Process Co., Providence, recently organized, has established a plant at 336 Douglas Avenue, for electroplating and other mechanical service. Charles W. Osberg and Arthur T. Shoren head the company.

The H. B. Ives Co., New Haven, Conn., manufacturer of hardware products, has awarded a contract to Sullivan & McKeon, New Haven, for a four-story addition, with one-story wing extension, 30 x 80 ft.

The DuBarry Mfg. Co., Middlefield, Conn., manufacturer of metal specialties, has acquired the plant and business of the National Hair Pin Co., Hartford, Conn., and will remove the business to Middlefield. The latter plant will be enlarged.

The J. J. Walsh Co., 1540 Columbus Avenue, Roxbury, Boston, manufacturer of automobile bodies, is taking bids for two-story addition, 50 x 100 ft., estimated to cost close to $30,000. S. J. Rantin, 1117 Columbus Avenue, is architect.

John W. Leahy, Danbury, Conn., is in the market for a ⅞ Cleveland model B and a 1½ Cleveland model B automatic screw machines, used.

Baltimore

BALTIMORE, Oct. 23.

THE Terminal Refrigerator & Warehouse Co., Washington, affiliated with the Washington Market Co., Seventh Street and Pennsylvania Avenue, will take bids until Nov. 1 for a new eight-story refrigerating and cold storage plant near the Pennsylvania Railroad. A. P. Clark, 816 Fourteenth Street, N. W., is architect.

The Protector Non-Skid Chain Co., 1301 West Baltimore Street, Baltimore, recently organized, has arranged with the Maryland Metal Products Co., Hagerstown, Md., to carry out initial production at its plant. Later it is proposed to build a plant exclusively for company manufacture. Oscar M. Peters is president and general manager.

The American Ice Co., Calvert Building, Baltimore, will build a one-story plant, 59 x 107 ft., at Regester and Gough Streets, to cost about $60,000. Plans have been completed.

The Cumberland Edison Power Co., Cumberland, Md., recently organized by Thomas B. Finan, Cumberland, and associates, has acquired the plants and properties of the Edison Electric Illuminating Co., and the Cumberland Electric Railway Co.; the first noted operates two power plants. The new owner will merge the companies and plans for extensions and improvements.

The Bureau of Supplies & Accounts, Navy Department, Washington, will take bids for the following equipment for the Mare Island Navy Yard, San Francisco: Until Nov. 7, for 1190 adjustable pipe wrenches, schedule 233; until Nov. 14, for one I-beam crane, schedule 239; until Oct. 31, for one universal milling machine, schedule 241; until Nov. 7, for one crank shaper, schedule 252; one engine lathe, schedule 253, and one electric oven and soldering pot, schedule 235.

The Lambert-Hudson Motors Co., 1212 Connecticut Avenue, N. W., Washington, local representative for the Hudson automobile, has awarded a contract to Parsons & Human, 816 Twenty-second and M Streets, for a new service and repair building to cost $160,000.

The Trent-Amalgam Co., Alexandria, Va., has leased the local plant of the Virginia Shipbuilding Co., and will take immediate possession. A subsidiary company is being organized under the name of the Western Marine & Salvage Co., to operate a shipyard on a portion of the property. The other part will be used for a plant for the manufacture of fuel from slack coal and fuel oil. Machinery will be installed.

The Trexler Co., Bellevue Court Building, Philadelphia, manufacturer of air lock valves, transmission locks and other automotive accessories, has acquired the plant of the Artillery Fuse Co., South Wilmington, Del., on 27-acre site. The company will establish a new plant. E. G. Flannery is vice-president.

J. W. Simpson, Roanoke, Va., and associates, have acquired mica properties in Patrick County, Va., and plan the erection of a new pulverizing mill and power house estimated to cost $60,000.

The Wilson-Hock Co., City Point, Va., machinery dealer, is making inquiries for one direct-connected engine generator set, from 50 to 75 kw.

The Southern Power Co., Charlotte, N. C., has authorized plans for a new steam-operated electric power plant at Eno, N. C., with capacity of 25,000 kw., supplementing a similar station to be built at Mountain Island, N. C. The Eno plant is estimated to cost close to $1,000,000.

The Bureau of Yards and Docks, Navy Department, Washington, will take bids until Nov. 1 for the installation of a new refrigerating plant at the navy yard, Annapolis, Md.

The Potomac Public Service Co., Hagerstown, Md., has decided to double the capacity of its plant on the Potomac River, near Williamsport, Md., and will revise plans. It is estimated to cost in excess of $2,000,000, with machinery.

The Wheeling Corrugating Co., 801 McDonough Street, Richmond, Va., will build a two-story addition estimated to cost $17,000.

The Fiber Board Container Co., Richmond, Va., manufacturer of fiber products, has plans for rebuilding the portion of its works recently destroyed by fire with loss of $100,000, including machinery. The new plant will cost approximately a like amount.

The Seaboard Brass & Copper Co., Baltimore, recently organized with a capital of $100,000 to manufacture brass products, etc., has leased a portion of the building at the southeast corner of Gay and Water Streets. Brook H. Rollin is president.

The Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, will build a new one-story power house, 57 x 70 ft., at 700-24 West Pratt Street.

The Bartlett Hayward Co., Scott and McHenry Streets, Baltimore, manufacturer of gas plant apparatus, etc., has awarded contract to the Whiting Turner Construction Co., 427 East Lombard Street, for a one-story foundry, 200 x 260 ft.

The Sandy Run Electric Co., Mooresboro, N. C., recently organized, plans for the installation of an electric power house for service at Latimore, Ellenboro and vicinity. Leslie Hamrick, Latimore, is secretary and treasurer.

The Purchasing Agent, Post Office Department, Washington, will take bids until Nov. 1 for 2500 boxes of lock washers.

R. C. Hearne, White Hall, S. C., has inquiries out for a high-speed planing machine.

The Denton Mfg. Co., Denton, N. C., is in the market for a hydraulic press.

Hoffman Brothers, Fort Wayne, Ind., have tentative plans under consideration for a new hardwood mill with power house in the vicinity of Columbia, S. C. F. E. Hoffman is head.

The Standard Electric Machinery Co., 7 East Hill Street, Baltimore, is inquiring for a used air compressor, 3500 to 4000 ft., 50 lb., with 25-cycle synchronous motor.

Buffalo

BUFFALO, Oct. 23.

A CALL for bids has been issued by the Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, for the erection of the first unit of its new assembling plant at Buffalo, two-stories, 335 x 900 ft. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

The Stabryte Steel Co., Inc., 8 Lord Street, Buffalo, is arranging for the installation of machinery in a local building to manufacture hardware and cutlery products. H. E. Bredemeir is head.

The Binghamton Light, Heat & Power Corporation, Washington Street, Binghamton, N. Y., has completed plans for a two-story addition to its power house at Willow Point, N. Y., to cost about $75,000.

The Fanning Co., Inc., Perry, N. Y., will commence the erection of a new ice-manufacturing plant, with initial capacity of about 1800 tons.

A. C. Fisher, Springville, N. Y., has plans in progress for the erection of a one-story machine shop, 50 x 100 ft.

The Porter-Cable Machine Co., Syracuse, N. Y., is arranging for expansion to provide for the removal of the local plant of the Syracuse Sander Mfg. Co., to the main works on East Water Street. The last noted company was recently acquired and the production of its line of grinding equipment will be continued.

The Empire Drawn Steel Co., 1133 Marine Bank Building, Buffalo, has plans nearing completion for the erection of a one-story building, 70 x 400 ft., to cost approximately $90,000. Harding & Crea, White Building, are architects.

William J. Teere, Buffalo, operating a forge shop at 1087 Genesee Street, is arranging to convert the works into an electric welding shop. New equipment will be installed.

The Automatic Gear Co., 712 Erie County Bank Building, Buffalo, has plans under way for the installation of equipment to manufacture gears. F. E. Freedman is head.

Roger J. Sweet, Buffalo, has acquired property at 1189 Niagara Street for the operation of an engineering service and machine works, parts production and welding.

Pittsburgh

PITTSBURGH, Oct. 23.

THE local trade is expectant. It has been quoting against a number of inquiries lately, including two moderate-sized railroad lists, and believes that the coming week will see the placing of orders. Actual machine tool business of the past week has been of rather slim proportions, both in volume and value, but with the railroads showing a real interest in the market, sentiment is decidedly cheerful about the immediate future.

Power equipment business has been moderate lately, but prospective business is good. The Carnegie Steel Co. has not yet closed for the power requirements in connection with the extension of its Clairton by-product plant. There are reports that the Cheat River power development in West Virginia, started a few years ago and then abandoned, may be revived before long.

The Pennsylvania Railroad, Central Region, took bids up to last Friday on the following list:

One 18-in. x 10-ft. lathe.
One 36-in. x 18-ft. lathe.
One 24-in. x 16-ft. lathe.
One 18-in. x 12-ft. lathe.
One 42-in. x 19-ft. engine lathe.
One 90-in. driving wheel lathe.
Two 28-in. shapers.
Two flue welders.

With the exception of one lathe for its Blairsville shops these tools are for the Conway shops, Freedom, Pa.

The Pittsburgh & Lake Erie Railroad recently put out the following list:

One 24-in. engine lathe.
One 36-in. engine lathe.
One 14-in. shaper.
One 28-in. shaper.
One 25-in. drill press.
One 90-in. driving wheel lathe.
One axle lathe.

The Guibert Steel Co., Diamond Bank Building, Pittsburgh, which is to build a steel fabricating plant on the west side of Pittsburgh, is a prospective buyer of punches and shears. It has already asked for bids on a 5-ton crane. The tool inquiry for the new Gary works, National Tube Co., is regarded as one against which action is likely at an early date. The Jones & Laughlin Steel Co., Pittsburgh, recently closed for three Shaw cranes, two of 5 tons and the other of 15 tons capacity, for installation at its South Side Pittsburgh works. One of the 5-ton cranes is equipped with a revolving spreader bar, which turns the trolley. The Pittsburgh & Lake Erie Railroad has closed for two Shaw overhead cranes, one of 7½ tons and the other of 10 tons capacity; the latter is a special type crane. Interest remains active in the 41 cranes soon to be placed by the National Tube Co. for its Gary works.

M. K. Frank, Frick Building, Pittsburgh, has recently equipped a plant at Carnegie, Pa., for the manufacture of pitt wagons for coal mines and sand plants.

The Neely Nut & Bolt Co., 26 South Twenty-Second Street, Pittsburgh, is taking bids for a one-story addition to its bolt works, 120 x 150 ft., estimated to cost $30,000.

The Central Refractory Co., Newark, Ohio, has acquired the plant of the Center Brick & Clay Co., Orviston, Pa., and firebrick manufacturing plant at Snow Shoe, Pa., with large fire clay deposits in Clinton County. The new owner plans for extensions and improvements.

The Hazel-Atlas Glass Co., Wheeling, W. Va., will build a new three-story machine shop, 45 x 80 ft., at its branch works, Washington, Pa., estimated to cost $50,000.

The Electric Alloy Steel Co., Charleroi, Pa., is planning for the installation of additional electric equipment, including a 500-kw. generator, two other generators of approximately like size, 800 and 500 hp. motors, controlling devices and auxiliary apparatus.

Power equipment, ovens, conveying machinery, etc., will be installed in the new baking plant to be erected in the vicinity of Ridge Avenue and Marburg Street, Pittsburgh, by the Ward Baking Co., New York, estimated to cost $1,500,000. Pittsburgh offices are at 3100 Liberty Avenue. George S. Ward is president.

The Oil City Boiler Works, Seneca Street, Oil City, Pa., has awarded contract to L. O. Boquin, Oil City, for a one-story addition, 60 x 75 ft.

Hubbard & Co., Granite Building, Pittsburgh, manufacturers of shovels, have plans for the removal of their plant at Aliquippa, Pa., to the main works on Butler Street, Pittsburgh, where an addition will soon be built. The Aliquippa plant is now closed on account of a strike.

The De Roth Steel Truck & Car Wheel Co., 611 Keystone Building, Pittsburgh, will install a number of traveling cranes at its new plant at Osgood, Pa., varying from 2 to 10 tons in capacity.

The Seneca Oil Works, South Carver Street, Warren, Pa., is planning the erection of an addition to cost $65,000.

The Highland View Mfg. Co., Marwood, Pa., manufacturer of metal specialties, is said to be arranging a list of tools for its addition, now in course of construction.

Cincinnati

CINCINNATI, Oct. 23.

RAILROADS and equipment companies have been the chief buyers in the machine tool market so far this month. A local company reports that up to date this month its orders from the railroads run well over $100,000, and with one under negotiation, which is expected to be placed this week, will more than double that amount. The Rock Island and Missouri-Kansas-Texas both placed orders in this market last week, and the latter is expected to close on the remainder of its requirements this week. Another Western road has practically concluded negotiations for a large number of tools, but formal orders have not been issued. The Baldwin Locomotive Works has placed an order in this district for 10 planers, and the Ramapo Iron Works is reported to have closed for 12. Lathe manufacturers report a very pronounced improvement in business, coming from all sections of the country and from all industries. One purchase was by an Eastern manufacturer of gear cutting machines, which included several heavy tools. The Mengel Body Co., Louisville, Ky., will shortly be in the market for complete equipment for a body building plant.

Prices are showing much strength. Practically all machinery manufacturers have advanced quotations from 5 to 15 per cent within the past month. The Avey Drilling Machine Co., Cincinnati, last week announced an advance of 15 per cent.

The crane market is fairly active, and prices are stiffening. One builder in this district is reported to have raised his prices approximately 20 per cent.

The Worthington Pump & Machinery Corporation was low bidder on pumping equipment for the Western Hills pumping station, Cincinnati. It will have a daily capacity of 8,000,000 gal. Work on the installation will commence shortly.

The Mengel Body Co., Louisville, Ky., has been organized and will be incorporated under the laws of New Jersey, to manufacture automobile and truck bodies. The Mengel Co., Louisville, box manufacturer, will be the principal stockholder. The company is preparing to erect a plant containing 200,000 sq. ft. of floor space and work will probably start this week. It will be located at Fourth and G Streets, occupying 30 acres, and will have direct railroad connections with both the Southern and Louisville & Nashville railroads. Complete equipment for the production of bodies will be installed. Contracts have been signed to deliver 30,000 bodies during 1923, and employment will be given to 500 people. The output of the plant for five years, estimated at $20,000,000, has also been contracted for. Plans for the new company were agreed upon by W. C. Durant, Detroit automobile manufacturer; R. Frank Munroe, Ludington, Mich., and William L. Hoge and Arthur D. Allen of the Mengel Co. Mr. Allen will be president of the new company, Mr. Hoge and Mr. Monroe vice-presidents.

The Fairfield Engineering Co., Lancaster, Ohio, has taken temporary quarters in the Alton Foundry Works, following the fire in its plant several weeks ago. Plans for the rebuilding are now being considered, but nothing definite has been announced. The company manufactures coal-loading machinery.

Improvements are now being made at the plant of the Advance Foundry Co., Dayton, Ohio, which will enlarge the molding and coremaking departments. Buildings and new equipment are being provided for both of these departments to take care of increased volume of business.

Cleveland

CLEVELAND, Oct. 23.

MACHINERY dealers report a fair volume of business from manufacturers of automobile parts. One parts manufacturer in Cleveland during the week placed six lapping machines for lapping piston pins and four automatic grinders were purchased by two others. Business as a whole, however, was dull, but some local dealers report that October sales are considerably ahead of the corresponding period during September. The trade has been looking for a good sized list from the Pennsylvania Lines, West, for the Columbus, Ohio, shops, but has been advised that an appropriation for this equipment has not yet been made and that the list will not be sent out before the first of the year.

Manufacturers of automatic screw machinery report an improvement in orders as compared with September, but sales are mostly in single machines. Gear cutting and grinding machinery is moving fairly well.

The Ohio Injector Co., Wadsworth, is inquiring for two drilling machines and a milling machine and is expected to purchase other equipment. The Van Dorn Iron Works Co. the past week purchased a multiple spindle drilling machine and the American Steel & Wire Co. a single spindle machine. The latter is inquiring for a cold saw.

The Brown Hoisting Machinery Co., Cleveland, has taken an order for a 10-ton coal and ore bridge for the Coal Trading Association, Rotterdam, Holland. This will be a duplicate of an ore bridge recently built by the Cleveland company for the same interest in Rotterdam.

The Baker R & L Co., Cleveland, plans the erection of a factory extension at an expenditure of $10,000.

The Miami Foundry Co., Miamisburgh, Ohio, has just completed an extension 60 x 144 ft.

The Buckeye Casting Co., Lima, Ohio, plans the erection of two foundry buildings at an estimated cost of $75,000.

The Ohio Public Service Co., has commenced the erection, at Lorain, Ohio, of a three-story building, 60 x 280 ft., for power plant purposes.

The Republic Structural Iron Works, 1290 East Fifty-third Street, Cleveland, is in the market for a used Toledo press No. 35P.

Catalogs Wanted

The Enterprise Mfg. Co., Akron, Ohio, will soon be in the market for sand blasting equipment and desires catalogs and prices for such equipment suitable for the manufacture of small brass, nickel silver, aluminum and steel parts.

The Central South

ST. LOUIS, Oct. 23.

PLANS are nearing completion for a one-story addition, 100 x 150 ft., for the Rabe Pipe & Foundry Co., North St. Elmo, Chattanooga, Tenn. R. R. Rabe is president.

The American Sash & Door Co., Sixteenth and Dellefontaine Streets, Kansas City, Mo., has preliminary plans in progress for a one-story addition, 100 x 300 ft.

The Appalachian Marble Co., P. O. Box 837, Knoxville, Tenn., is planning for the installation of electric pumping machinery.

The Means-Haskins Coal Co., Montago, Ky., is planning for the construction of a new coal tipple at its properties.

The United States Engineer Office, Custom House, St. Louis, will take bids until Oct. 30, for three drum tandem hoisting engines, as specified in circular 54-27.

The Louisville & Nashville Railroad Co., Louisville, plans the construction of a new engine house and car repair shops at Leewood, Tenn., estimated to cost $250,000, including machinery. W. H. Courtenay, Louisville, is chief engineer.

The Taylor Mfg. Co., Morristown, Tenn., is in the market for machinery for a wood-working plant, including planer, band saw, jointer, line shaft pulleys, motors, etc. W. H. Taylor, Morristown, is president.

The United Railways Co., St. Louis, has completed plans for a power house at Eighth and Franklin Avenues. A. T. Perkins, company headquarters, Thirty-ninth Street and Park Avenue, is general manager.

The Wood & Lane Co., 915 Olive Street, St. Louis, is in the market for an engine-generator set, from 250 to 500 kw.; also, for a motor-generator set, about 150 kw.

The Churchill Compress Co., Dyersburg, Tenn., has tentative plans for rebuilding its cotton compress plant, destroyed by fire Oct. 11 with loss estimated at $500,000, including machinery.

The McGregor Battery Engineering Co,. 681 Marshall Avenue, Memphis, Tenn., has completed plans for a new one-story factory, 30 x 105 ft., at 679 Monroe Avenue. Estes W. Maun, 618 Madison Avenue, is architect. J. M. McGregor is president.

The Common Council, Piggot, Ark., has tentative plans for a municipal hydroelectric generating plant.

The Tavern Rock & Sand Co., Klondike, Mo., is planning the construction of a new power house to replace that recently destroyed by fire.

The Cumberland & Manchester Railroad Co., Barboursville, Ky., has completed plans for a new one-story forge shop.

C. F. Lewis, 713 Ohio Street, Wichita, Kan., is making inquiries for machine shop equipment, including emery wheel, bench and hand tools, welding equipment, etc.

The Mountain Grove Creamery, Ice & Electric Co., Springfield, Mo., is planning to rebuild the portion of its power plant destroyed by fire Oct. 11, with loss of $100,000.

The Liquid Steel Welding Co., Kansas City, Mo., recently organized, will establish a plant at 101 West Twenty-third Street for the manufacture of welding equipment. Anton Lucas, previously connected with the Metal & Thermit Corporation, New York, heads the company.

The Kentucky Utilities Co., Jackson, Ky., has completed plans for a new one-story and basement power plant. Homer Gillem is general manager.

A. J. Slonecker, Trenton, Mo., is organizing a local company to establish a plant for the manufacture of jack screws.

The Missouri Pacific Railroad Co., St. Louis, has awarded contract to Jerome A. Moss, Chicago, for a new one-story plant, 120 x 510 ft., to include engine house, car repair and construction shops, at Kansas City, Mo.

The Nedringhaus Metalware Corporation, Goodfellow and Natural Bridge Avenues, St. Louis, in the the market for two used presses for blanking and light forming; beds about 36 in. x 72 in. between bousings.

The Beall Sales Co., 943 Syndicate Trust Building, St. Louis, is inquiring for a used Hess file grinding machine and other file-making machinery.

The Gulf States

BIRMINGHAM, Oct. 23.

A MACHINE shop will be erected by the P. H. Palmer Co., Jacksonville, Fla., recently organized. P. H. Palmer is president, and Charles Atkins, vice-president.

The Southwestern Gas & Electric Co., Shreveport, La., has arranged for a bond issue of $2,500,000, a portion of the proceeds to be used for extensions in power plants and system. Henry M. Dawes is president.

Fire, Oct. 18, destroyed a portion of the plant of the Lafayette Sugar Refining Co., New Orleans, at Lafayette, La., with loss estimated at $300,000, including machinery, power house, etc. It is planned to rebuild.

The Standard Electric Works, 17 Bibb Street, Montgomery, Ala., has plans for a new factory for electric motor construction, rebuilding and repair, etc.

The Dallas Power & Light Co., Dallas, Tex., has acquired property totaling more than three acres as a site for its new electric generating plant, estimated to cost $2,180,000. Joseph H. Gill is assistant general manager.

The Monroe Sand & Gravel Co., Monroe, La., recently organized, is arranging a list of equipment for installation at its properties, including steam shovel, industrial locomotive, etc. T. E. Stephenson heads the company.

The Southern Paper Co., Moss Point, Miss., has plans for extensions, including main paper and pulp mill, and power house. It is expected to increase the capacity to close to 100 tons per day. E. H. Mayo is general manager.

The Foley Light & Power Co., Foley, Ala., has completed plans for a new power house, estimated to cost $50,000.

Fire, Oct. 14, destroyed a portion of the plant of the S. J. Stewart Electric Motor Co., 527-31 St. Joseph Street, New Orleans, with loss estimated at close to $75,000, including equipment and stock.

The New Orleans Railway & Light Co., New Orleans, has plans under way for two new power houses, with an addition to the present generating plant. The work is estimated to cost in excess of $150,000. Dwight P. Robinson & Co., 125 East Forty-sixth Street, New York, are engineers. Frank Frost is superintendent.

The Peninsular Ice & Cold Storage Co., Daytona Beach, Fla., recently organized with a capital of $200,000, is contemplating the erection of a new ice-manufacturing and cold storage plant to cost $100,000, including machinery. Guy G. Bailey is president.

The Magnolia Petroleum Co., Dallas, Tex., has plans under way for a new oil storage and distributing plant at Oilton, Tex., to include the installation of steel tanks, pumping machinery, etc., estimated to cost $200,000. Headquarters and main plant for the Webb-Zapata oil field will be established at this point.

The Citizen's Ice Co., Athens, Tex., is planning to rebuild the portion of its ice-manufacturing plant destroyed by fire, Oct. 13, with loss estimated at $65,000, including equipment. The company is headed by F. N. and S. A. Drane.

The Common Council, Valley Mills, Tex., has plans under way for the installation of a municipal electric light and powerhouse. Bids will be asked at an early date. Roy S Pool is secretary.

The St. Louis, Brownsville & Mexico Railroad Co., Brownsville, Tex., has acquired about 30 acres for the construction of new locomotive and car shops, etc. The present plant at Victoria, Tex., wll be removed to the new location and considerably enlarged.

The Consolidated Motor Co., Marianna, Fla., is inquiring for machine shop equipment for installation in a local building. L. Williams is secretary.

The Common Council, Utica, Miss., will take bids until Nov. 9 for equipment for a municipal electric plant, including oil-operated engine, two electric alternators, switchboard, pumping machinery, etc. Swanson-McGraw, Inc., 705 United Fruit Building, New Orleans, is engineer. R. F. Cook is mayor.

The Forest Products Co., Ltd., Montgomery, Ala., machinery dealers, is inquiring for a band saw, 36-40 in., used, in good condition, and other wood-working machinery.

The Moore Dry Kiln Co., Jacksonville, Fla., is in the market for a used 2-in. Landis pipe threading and cutting machine with four-style chaser head, motor driven preferred.

Milwaukee

MILWAUKEE, Oct. 23.

RAILROADS are becoming more of a factor in the volume of local machine tool business, although with respect to the milling machine industry, requirements from this source are relatively very small. Automotive shops remain the principal source of demand, with the gas engine trade as considered apart from passenger and commercial vehicles a factor of increasing importance. Leather and textile machinery makers continue to buy moderately. The Nash Motors Co. so far has placed only a part of the needs for the extension of its four-cylinder car works in Milwaukee, and in November and December will be in the market for the supplementary equipment of the new LaFayette car plant, now under construction in Milwaukee. Machine shops are busier than at any time since spring, but their needs as yet are limited, as available capacity is still in excess of needs and tools are being bought principally for replacement. General inquiry is more active and the trade is confident of a steady enlargement of business through the winter.

The Acme Brass & Metal Works, Waupaca, Wis., recently incorporated with $75,000 capital stock, has purchased the property of the Jorgenson Mfg. Co. of Waupaca, consisting of a brass foundry and machine shop, from the receiver. Operations were resumed Oct. 16 on a limited initial scale, the plant having been idle since bankruptcy proceedings were instituted in April. The Acme company will specialize, as the Jorgenson interests did, in automotive equipment specialties, principally gas engine priming devices, but will broaden the general scope of the business into general brass and bronze castings, raw and machined. For the present it will not make any material additions to the shop equipment. J. M. Brown, Appleton, Wis., is president of the Acme company; Lewis Larson, Waupaca, vice-president; E. M. Nelson, secretary; C. J. Pommer, treasurer; S. K. Wood, sales manager.

The Vulcan Last Co., Portsmouth, Ohio, has started the work of reconstructing its mill and factory at Crandon, Wis., which was almost totally destroyed by fire early in September, with a loss of $675,000. The Crandon plant furnishes the semi-finished material for shoe lasts for three large last plants operated by the Portsmouth concern. Plans for the new works call for a complete finishing plant as soon as

the present construction is completed about Dec. 1 or 15, and later a similar unit in Milwaukee. J. C. Knott is general manager at Crandon.

The Borden Condensed Milk Co., New York, has decided to equip a factory for manufacturing containers in connection with its plant at New London, Wis. It is to have a daily capacity of 150,000 metal cans.

The Rauschenberger Tire Co., Akron, Ohio, has purchased five acres along the Chicago & Northwestern main line tracks in the town of Granville, just north of Milwaukee, and intends to erect a three-story plant, 175 x 300 ft., employing about 250. Plans have been completed and contracts will be let about Oct. 30.

The Appleton Motor Truck Co., organized at Appleton, Wis., with $50,000 capital stock, has acquired the factory group of the defunct Reliance Motor Truck Co., Appleton, and besides resuming the production of motor trucks and truck axles, will enter the farm implement field with a number of new designs of planting machines. This will require some retooling and installation of new equipment, the purchase of which will be made early in 1923. Officers of the new corporation are: President, A. G. Brusewitz; vice-president, John Heenan; secretary, William Geenen; treasurer, Matthew Rossmeisel.

The Capitol Plating & Machine Co., Madison, Wis., is installing some additional equipment for quantity production of windshield spotlights and other illumination specialties.

The Excel Mfg. Co., 3402 South Pierce Street, Milwaukee, closes bids Oct. 24 on a two-story brick and concrete addition, ell-shaped, 60 x 180 and 30 x 180 ft. for wood-working processes. The extension will cost about $50,000. R. E. Oberst is architect.

The F. J. Greene Engineering Works, 1028 Douglas Avenue, Racine, Wis., has placed the contract for a three-story addition, 53 x 103 ft., with the Nelson Construction Co., local. With equipment, now being purchased, the enlargement will cost about $50,000. The architects are Edmund B. Funston & Co., Racine.

The Althouse-Wheeler Co., Waupun, Wis., is completing the renovation and partial retooling of its plant at 11-19 East Main Street, which was badly damaged by fire last spring. It manufactures steel towers, windmills, tanks, etc., and also conducts a gray iron foundry. Operations are being resumed with a force of 50. E. D. Doney is president, and H. O. Thompson, works manager.

The Kohler Co., Kohler, Sheboygan County, Wis., has let the general contract to Paul Riesen's Sons Co., 1018 Humboldt Avenue, Milwaukee, for a four-story addition, 70 x 160 ft., to be equipped for grinding and preparing enamels for sanitary goods department. The Riesen company has sublet the reinforcing bars, amounting to 190 tons, to the Concrete Engineering Co. The architects are Brust & Philipp, 405 Broadway, Milwaukee.

The Corona Pen Co., Janesville, Wis., has started the operation of its new factory in the Bicknell Building on North Academy Street. Additional floor space has been contracted for and will be equipped for larger production immediately. S. V. Corona, formerly identified with typewriter manufacturing interests, is president and general manager.

The Pacific Coast

SAN FRANCISCO, Oct. 17.

CONTRACT has been awarded to the Austin Co., Pacific Electric Building, for a new one-story foundry, 56 x 152 ft., for the Kay-Brunner Steel Casting Co., Los Angeles.

The Southern California Edison Co., Los Angeles, has arranged for a bond issue of $10,000,000, a portion of the proceeds to be used for power plant and system extensions.

The Shell Oil Co. of California, 343 Sansome Street, San Francisco, has plans under way for a new refinery on 5-acre site at Wilmington, Los Angeles harbor, estimated to cost $1,000,000, including extensions to local storage and distributing plants.

Fire, Oct. 9, destroyed a portion of the refinery and storage works of the Richfield Oil Co., Twenty-fourth street and Santa Fe Avenue, Los Angeles, with loss estimated at $200,000, including machinery. It is planned to rebuild.

The Yuba Development Co., Hobart Building, San Francisco, will soon make inquiries for an electric traveling crane, about 20-tons capacity.

The People's Ice Co., Fresno, Cal., will commence the erection of a two-story addition to its plant, 100 x 150 ft., at Woodward Street and Anna Avenue, to cost $100,000, including machinery.

The Amalgamated Talc Co., Los Angeles, is having plans drawn for a new one-story mill, 40 x 160 ft., on East First Street. The installation will include milling machinery, pulverizing equipment, power apparatus, etc. A. Godfrey Bailey, 410 Junior Orpheum Building, is architect.

The Puget Sound Power & Light Co., Seattle, Wash., has arranged for a bond issue of $1,300,000, a portion of the proceeds to be used for extensions. Frederick S. Pratt is chairman of the board of directors.

The Progressive Sales Co., Tacoma, Wash., has plans under way for a new plant to manufacture automobile springs, shock absorbers and kindred equipment. It will cost about $35,000. J. E. Drain is president.

The Common Council, Canby, Ore., has authorized the preparation of plans for a municipal electric light and power plant, estimated to cost $50,000.

The Sandpoint Lumber & Pole Co., Sandpoint, Idaho, has plans under way for the construction of a new branch mill at Troy, Mont., with daily capacity of 60,000 ft., estimated to cost $150,000. A power house will be built. H. C. Culver, Spokane, Wash., is president.

The Discovery Bay Logging Co., Port Townsend, Wash., has tentative plans for the rebuilding of its plant, with power house, machine shop and other buildings, destroyed by fire recently with loss estimated at $350,000, including machinery.

Indiana

INDIANAPOLIS, Oct. 23.

THE Baltimore & Ohio Railroad Co., South Wells and West Harrison Streets, Chicago, has preliminary plans for a number of one and two-story additions at its car and locomotive repair works, Garrett, Ind., estimated to cost $500,000, including equipment.

The Blackford Window Glass Co., Vincennes, Ind., recently reorganized with a capital of $1,000,000, has plans in progress for new works on a 6-acre site, lately acquired, estimated to cost $300,000, including machinery, power house, etc. Frank Bastin is president.

Fire, Oct. 17, destroyed a portion of the car shops of the Monon Railroad, Lafayette, Ind., with loss estimated at $50,000.

Cline & Hicks, Lebanon, Ind., are having plans prepared for a new one-story machine shop, 60 x 100 ft., with two other mechanical shops adjoining, 40 x 60 ft. and 40 x 40 ft., estimated to cost $40,000.

The Common Council, Auburn, Ind., is completing plans for an addition to the municipal electric light and power plant to cost $60,000. E. E. Weinland is engineer.

The Wabash Valley Electric Co., Terre Haute, Ind., has plans under way for a hydroelectric power house on the Wabash River, Sugar Creek Township, estimated to cost $3,000,000, including transmission system.

Fire, Oct. 14, destroyed a portion of the oil storage and distributing plant of the National Refining Co., Lafayette, Ind., with loss estimated at $100,000, including machinery. It is planned to rebuild.

The Vigo Mining Co., Rose Dispatch Building, Terre Haute, Ind., will take bids early in November for the construction of a power plant at its mine No. 29, Sullivan County, to cost $75,000. The Shourds-Stoner Co., 510 Tribune Building, Terre Haute, is architect and engineer.

Homer A. Woods, 19-29 South Street, Indianapolis, manufacturer of metal and electric specialties for automobile service, will erect a new four-story plant, 60 x 200 ft., estimated to cost $200,000. The machinery installation will cost in excess of $60,000.

The plant and property of the Spacke Machine & Tool Co., Madison Avenue and Merrill Street, Indianapolis, and branch plant at Charles Street and the Belt Railway, used for the manufacture of axles, etc., will be offered for sale by the receiver, Charles O. Roemler, on Oct. 30.

Canada

TORONTO, Oct. 23.

BUSINESS in machinery and machine tools is gradually extending beyond the replacement stage, which has been the main feature of this market for some time. Industrial concerns are now calling for equipment for new plants and additions, as well as for bettering operating conditions. Inquiries for various lines are numerous and while large lists are still few there is a steady increase in the number of buyers. It is generally known that the Canadian railroads are badly in need of new rolling stock, in fact the Grand Trunk recently sent out an inquiry for some 7000 freight cars. Equipment for car building shops is coming into

better demand and some fairly good sales have been reported. The demand for wood-working tools and equipment continues to head the list. A slight improvement is reported in the call for small tools and sales so far this month are better than for the corresponding period last month.

Prices are still holding firm and no further changes have been announced.

The Standard Shingle Co., Hereward Road, Vancouver, B. C., will erect a shingle mill and is interested in equipment.

The sawmill owned by the J. D. Buckley Estate, Nordin, N. B., was destroyed by fire with a loss of $150,000.

The Peninsular Cord Tire & Rubber Co., 45 St. John Street South, Hamilton, Ont., is preparing to erect a plant at Hanover, Ont.

The Windsor Machine & Tool Co., Windsor, Ont., is making arrangements for the erection of a manufacturing plant at St. Thomas, Ont., to cost $100,000.

Equipment is now being installed in the addition recently completed to the machine shop of the Springer Lock Mfg. Co., Belleville, Ont., including one Brown & Sharpe universal milling machine with vertical milling attachment; a die engraving machine, shaper, large punch press, a battery of three screw machines, two dozen bench vises and a miscellaneous lot of power-driven bench tools.

The Canadian Locomotive Co., Ltd., Kingston, Ont., has taken on 105 men in the last few days for locomotive repair work. William Casey, general manager, states that the Canadian railroads are inquiring for locomotives and there is every prospect that orders will be placed at an early date.

Pittsburgh Steel Co. Earnings

The comparative income account of the Pittsburgh Steel Co. for the year ended June 30, last, as disclosed by its annual pamphlet report, follows:

	1922	1921	Decrease
Net earnings after deducting all charges for operations and idle plant expenses, including maintenance and repairs	$902,300	$3,817,030	$2,914,730
Interest and income from investments	199,988	338,870	38,883
Miscellaneous revenue	115,804	108,600	*7,204
Balance of reserve of 1920 set up to cover depreciation in price of Liberty Bonds, not now required	19,001	69,729	50,728
Appreciation of Liberty Bonds to par value, June 30, 1922	360,068		*360,068
Adjustment for reserve for federal taxes	270,427		*270,427
Adjustment of Pittsburgh Steel Ore Co. assets	39,565		*39,565
Total earnings	$1,907,152	$4,234,228	$2,327,077
Less:			
Reserve for depreciation of plants	$800,697	$884,825	$84,128
Reserve for depletion of mine properties	65,633	101,065	35,431
Reserve for income and profits tax		143,182	143,182
Interest on unmatured installments of purchase price of Alicia properties	75,625	103,125	27,500
Loss on sale of Liberty Bonds		60,362	60,362
Loss on sale of capital assets, Rowe mine		123,824	123,824
Loss on sale of capital assets, Chicago warehouse property	38,250		*38,250
Reduction of inventory values	65,063	1,095,320	1,030,257
	$1,045,268	$2,511,701	$1,466,433
Net income for the year	$861,883	$1,722,527	$860,644
Dividends on preferred stock	$735,000	$735,000	.....
Dividends on common stock	560,000	840,000	280,000
	$1,295,000	$1,575,000	$280,000
Surplus for the year	†$433,117	$147,527	$580,644

*Increase.
†Deficit.

For the nine months ended Sept. 30, the Otis Elevator Co. reports a net income of $1,790,482, after charges and federal taxes, which amounts to $10.52 per share on the common stock after allowing for preferred dividends. This compares with $11.62 per share in the same period of 1921.

The Virginia Iron, Coal & Coke Co., Roanoke, Va., reports net earnings for the first nine months ended Sept. 30, of $288,799. Third quarter earnings were $273,886, as compared with a net loss in the first quarter of $81,048, and net earnings in the second quarter of $95,960.

STEEL AND INDUSTRIAL STOCKS

U. S. Steel Strikes a New High—Future Trend by No Means Certain

Irregularity characterized steel and industrial stocks last week, the dominant factor in movements still clinging to the series of expected dividends. There was considerable profit taking and some short selling. Violent fluctuations set in Tuesday, carrying in their wake a steady stream of liquidation, but alternating with this came downward movements against which pivotal stocks like Baldwin and Steel common withheld. The fundamental soundness of the market was reflected in the ability of American Can to reach the highest level ever attained, and of U. S. Steel common to reach another new high at 111½. Some bullish talk attached to American Can, whose advances have been linked with the rise in Continental Can. These two with National Enameling are brought forward as a group which may follow an upward trend. Industrial prospects are good, the average of 20 stocks dropping but slightly. The immediate future of the market is still in a maze. Various conjectures of an unusual market are now discounted in favor of a general concurrence that no buying wave is in progress, such as occurred early in 1907 and late in 1919.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalm.	47¾	52⅝	Gulf St. Steel pf.	98	98
Allis-Chalm. pf.	94	99½	Int. Har.	109	112¾
Am. B. S. & Fdry.	79	80	Int. Har. pf.	118½	118½
Am. B. S. & F. pf.	112½	113	Lackawanna Steel	82	85
American Can	70⅝	76¼	Lima Loco.	59⅛	61½
American Can pf.	110½	111	Midvale Steel	33½	35
Am. Car & Fdry.	189	195	Nat.-Acme	14¼	15½
Am. Car & F. pf.	121⅞	123	Nat. E. & Stm.	66	68½
Am. Locomotive	131	136½	Nat. E. & Stm. pf.	100¼	103
Am. Locomot'e pf.	121	121¼	N. Y. Air Brake	38	40½
Am. Radiator	119⅞	122	Otis Steel	10¾	11
Am. Steel Fdries.	43½	45¼	Pittsburgh Stl. pf.	94¼	94¼
Am. Steel Fdr. pf.	105	106⅛	Pressed Stl. Car.	89	92
Baldwin Loco.	137½	142⅝	Ry. Steel Spring	121	123⅜
Baldwin Loco. pf.	117	118	Ry. Stl. Spring pf.	117	117
Bethlehem Steel	72½	76¼	Replogle Steel	31¼	34⅜
Beth. Stl. Cl B	73½	78½	Republic	54¼	61⅛
Beth. Stl. 8% pf.	111⅞	113	Republic pf.	85½	88½
Br. Em. Steel	13	14	Sloss	48⅞	50⅞
Br. Em. S. 1st pf.	74½	74½	Steel of Canada	66¼	69½
Br. Em. S. 2d pf.	32½	35	Superior Steel	32¼	33
Cambria Steel	41	41	Un. Alloy Steel	37	38
Chic. Pneu. Tool	84	87	U. S. Pipe & Fdry.	31½	34
Colorado Fuel	31	33½	U. S. Pipe & F. pf.	70¾	70¾
Crucible Steel	83½	90½	U. S. Steel	107½	111½
Crucible Steel pf.	95	96	U. S. Steel pf.	122	122½
Deere pf.	72½	73	Vanadium Steel	43	47
Gen. Electric (8)	182½	189	Va. I. C. & Coke	55½	58
Gt. No. Ore Cert.	33½	39½	W'house Air Br.	99	99
Gulf States Steel	88⅜	94¼			

Empire Steel Corporation Reorganization

The much talked of and always more or less intangible British Empire Steel Corporation reorganization and financial deal which has maintained an unusual interest in the corporation and its securities since last spring was stated to be "off" when President Roy Wolvin, subsequent to a meeting of the board of directors held in Montreal, Que., Oct. 18, issued a statement to the effect that he had been unable so far to make the proposition sufficiently attractive to the financial houses with which he had been negotiating.

Following the meeting of the board of directors, however, it was pointed out that Roy Wolvin was about to leave for New York for the purpose of arranging other plans for the financing of the corporation. It is rumored that a New York financial house submitted an offer about a fortnight ago, when the option on the financing lapsed to float bonds to the extent of approximately $5,000,000.

Republic Iron & Steel Co. Deficit

That the coal and railroad labor troubles materially increased steel mill production costs is reflected in the quarterly earnings statement of the Republic Iron & Steel Co. for the period ending Sept. 30. The income account shows operating profits of $395,756, which after allowances of $252,338 for depreciation and renewals, $49,886 for exhaustion of minerals, $232,228 for bond interest, left a deficit of $138,676. This showing contrasted with that made in the second quarter is less favorable, but a comparison with the income account for the third quarter of 1921 shows a decided improvement in the affairs of the company to-day.

For instance, in the quarter ending Sept. 30, last year, instead of an operating profit, there was a deficit of more than $1,000,000, and after ordinary charges and the payment of $437,500 in preferred dividends, a deficit of more than

$1,800,000. For the first nine months of 1922 a total deficit of $764,376 is shown, whereas last year for the same period there was a deficit of practically $4,000,000.

Unfilled business on the books of the company as of Sept. 30 last amounted to 199,431 tons of finished and semi-finished products, contrasted with 196,886 tons on June 30, last, and 69,577 tons on Sept. 30, last year.

Industrial Finance

The Grant Motor Car Corporation, Cleveland, was placed in receivership Oct. 20 on complaint of the Durston Gear Corporation, Syracuse, N. Y., which declared that a receiver was needed to preserve the assets of the company. Federal Judge D. C. Westenhaver appointed Joseph C. Hostetler, attorney, receiver. The company has $4,285,000 in outstanding stock. Its debts are placed at $1,478,000 and include $167,000 in open accounts, $232,000 due to merchandise creditors, $638,000 in notes and mortgages held by banks and $500,000 owed to holders of long term notes.

Owing to the fact that the Canadian railways were not in the market for new cars to any extent, the National Steel Car Corporation, Hamilton, Ont., in the fiscal year ended June 30, 1922, showed a new loss of $79,733.52 before providing for depreciation on buildings, machinery and equipment and interest on mortgage bonds and borrowed money. This compares with net profits of $422,674, in the preceding fiscal year. The capital and surplus as at July 1, 1921, was $2,820,324. From this sum was deducted $7,247 for depreciation, $107,653 interest on bonds and $46,516 interest on borrowed money, which together with an appropriation to cover the operating losses, made total dueductions of $306,373, and left a balance at June 30, 1922, of $2,513,950. Approximately $80,000 was expended during the year in betterments to plant and equipment

Plans of New Companies

John T. Hill, formerly president of R. C. Hoffman & Co., Inc., announces the formation of John T. Hill & Co., 1318 Continental Building, Baltimore, and will deal in relaying rails, scrap, track material of all kinds, sheets, iron and steel bars, reinforcing material, structural shapes, etc., and will also serve as consulting engineers, specializing in inspection and valuations.

The American Fuel Power Co., Inc., 78 Main Street, Buffalo, has been incorporated with a capital of $500,000, to manufacture electric and other power machinery. Its properties and equipment are adequate for the present. Certain parts of its work will be done by contract. The incorporators are: A. Stover, Jr., J. M. Aitken and S. J. Renthcler. John C. Mefts is president.

The Hayes Brass Foundry, 132 Richmond Avenue, Syracuse, N. Y., which was recently incorporated, has a fully equipped foundry for turning out limited quantities of castings, etc. C. H. Hayes heads the company.

The Seneca Foundry Co., Waterloo, N. Y., has been incorporated with a capital of $25,000, and will manufacture iron and steel castings. The incorporators are: J. F. Madia and C. Cannull. W. S. O'Brien, Geneva, N. Y., represents the company.

The Solter Co., Philadelphia, has filed articles of incorporation to manufacture metal products. However, no manufacturing will be done, the company acting for the present merely as selling agent. Illoway & Felix, Room 509, 213 South Bread Street, Philadelphia, represents the company.

The Empire Drawn Steel Corporation, Marine Trust Building, Buffalo, recently incorporated with a capitalization of $750,000, 8 per cent preferred and 30,000 shares of no par common stock, to equip and operate a cold-drawn steel plant, has placed specifications for buildings with Harding & Crea, Buffalo. F. W. Allan, president and F. R. Kew, works manager, are handling the purchase of draw benches, straightening, cut-off and pointing machines, etc. The main building will be 70 x 450 ft., capable of supporting a five-ton crane, and together with a number of additions will enable the company to turn out 36,000 tons of cold-drawn steel annually.

The Chattanooga Plating & Smelting Works, 20½ West Ninth Street, Chattanooga, Tenn., which was recently incorporated, is considering bids on its new construction program, a part of which is to be taken care of by its immediate working forces.

The Gray Hub Co., 642-46 Catherine Street, Detroit, has been incorporated with a capital of $30,000, and will manufacture automobile parts, principally hubs, pistons, etc. R. B. Gray and Guy Swartz, both of whom served several years with the Timken Axle Co., Detroit, are connected with the new company, which had been organized as a partnership for nearly a year.

The Spotz Mfg. Co., 100 Broadway, New York, and its foreign complement, the C. A. Spotz Co., Inc., were recently incorporated under Connecticut laws to manufacture machinery and mechanical equipment. The American firm has a capital stock of $100,000. The chief product will be a new design of weighing scale adapted to an entirely new mechanical principle. Patents are held for the chief foreign countries and have been applied for in the United States. Operations will not begin immediately since the officers are completing a program of demonstration from the A. H. Emery laboratories at Glenbrook, Conn. The company expects that at first it will have its castings and parts let out to contract, using the Glenbrook plant for assembling. However, if demonstration tests prove to be as successful as expected, the company will erect its own building and install equipment for making the parts. Harry M. Rice is president; C. A. Spotz is vice-president and chief engineer; A. H. Emery, Jr., secretary and Carlton Pratt, treasurer.

The Gerace Willow Stripper & Accessories Co., 3519 St. Clair Avenue, Detroit, has been incorporated with a capital of $25,000, to manufacture willow-stripping and willow-manufacturing machinery. In the event of booking large contracts, the manufacture of parts will be done by contract and assembling will be done at the present location. Grant Clary is secretary.

The A. E. Stevens Co., Inc., Portland, Me., has been incorporated with a capital of $50,000, to take over the business of A. E. Stevens & Co. in the manufacture of gears, wagon parts, etc. The latter company was a partnership, the reorganization coming as a result of the death of one of the partners, Samuel A. Stevens. Paul R. Stevens is president of the new company.

The Rebstock Co., 1439-43 North Nineteenth Street, St. Louis, has been incorporated with a capital of $12,000, and has purchased complete equipment to engage in the manufacture of conveying machinery, including gravity roller, bottle, bucket, chain and power apron conveyors, and chutes, hoists and conveyor supplies. A. J. Rebstock is president; C. A. Kohl, vice-president; W. M. Wolters, secretary, and A. J. F. Wolters, assistant secretary.

L. J. Krom, metallurgical engineer, has established an office at 50 Church Street, New York, for the purpose of carrying on a consulting, metallurgical and engineering practice which will be devoted to the production and consumption of metals and alloys. Mr. Krom is an expert in the nonferrous lines.

The Sun Recharger Co., 4344 Cottage Grove Avenue, Chicago, was recently incorporated to manufacture magnetos. The steel cabinets used in making up the recharger unit are manufactured by the Metzger Co., Chicago. Other parts used are principally standard electrical units. The incorporators are John T. Jenkins, H. B. Floyd and H. W. Hoppe.

The Square Deal Mfg. Co., South Side Market Street Bridge, Wilmington, Del., has been incorporated with a capital of $25,000, and is manufacturing heavy duty internal combustion marine engines; it also designs and builds special machinery and does general machine work and pattern work. Charles O. Robertson heads the company.

The Acme Mfg. Co., 116 Market Street, Newark, N. J., was recently incorporated to manufacture brackets and other metal goods. Its work is being done on a contract basis at present, but preparations are under way to do its own manufacturing.

The Connecticut Electric Instrument Co., 54 Church Street, Hartford, Conn., has filed notice of organization to manufacture electrical instruments, having taken over the radio appparatus business of the Hartman Mfg. Co., that city. It is in the market for a limited amount of equipment. About Jan. 1, it is expected, the company will lease properties and install light machine and bench equipment. At that time it will require some raw and semi-finished material.

The Joyce Mfg. Co., 2970-3000 Jefferson Avenue, Detroit, has been incorporated with a capital of $500,000 to manufacture automobile equipment and accessories. It has leased a factory formerly occupied by the Fisher Body Co. and is installing equipment. The company plans to be ready for operation in about 30 days. Frank H. Joyce is president.

The Seaboard Foundries, Inc., 602 Driggs Avenue, Brooklyn, has been incorporated with capital of $110,000 to manufacture iron, steel and other castings. It is disposing of properties now held in Brooklyn and is developing plans to govern future operations on a larger scale. The incorporators are H. W. Eldred, J. C. Garrett and R. J. West.

The Natlay Chain Corporation, New York, has been incorporated with a capital of $100,000 to manufacture steel chains and other mechanical products. Its chief product will be a patented chain which is said to possess unusual merits. Actual operation will not start immediately. B. M. Bancroft and W. Hutchinson are the incorporators. The company is represented by Henry Amerman, 233 Broadway, New York.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.04c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.04c.
Hoops, base price	4.39c.
Bands, base price	3.84c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.14c.
Channels, angles and tees under 3 in. x ¼ in., base	3.04c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.10c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.30c.
Toe-calk, ½ x ⅜ in. and larger	4.15c.
Cold-rolled strip, soft and quarter hard	6.75c. to 7.25c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	3.90c.
Squares, flats and hex	4.40c.
Standard cast steel, base price	15.00c.
Extra cast steel	18.00c.
Special cast steel	23.00c.

Tank Plates—Steel

¼ in. and heavier	3.14c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.19c.
No. 12	4.24c.
No. 14	4.29c.
No. 16	4.39c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.30c. to 4.70c.	.....
Nos. 22 and 24	4.35c. to 4.75c.	5.00c.
No. 26	4.40c. to 4.80c.	5.05c.
No. 28	4.50c. to 4.90c.	5.15c.
No. 30	4.75c. to 5.15c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.60c. to 5.00c.
No. 16	4.75c. to 5.15c.
Nos. 18 and 20	4.90c. to 5.30c.
Nos. 22 and 24	5.05c. to 5.45c.
No. 26	5.20c. to 5.60c.
No. 27	5.35c. to 5.75c.
No. 28	5.50c. to 5.90c.
No. 30	6.00c. to 6.40c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt	—50	—42	½ in. Butt	—11	+13
¾ in. Butt	—55	—44	¾ in. Butt	—17	— 1
1-3 in. Butt	—57	—44	1-1½ in. Butt.	—20	— 2
2½-6 in. Lap	—54	—41	2 in. Lap	—14	+ 2
7-8 in. Lap	—50	—26	2½-6 in. Lap.	—18	— 2
9-12 in. Lap	—46	—25	7-12 in. Lap	—10	+ 6

Steel Wire

BASE PRICE* ON No 9 GAGE AND COARSER	Per Lb.
Bright basic	4.25c. to 4.50c.
Annealed soft	4.25c. to 4.50c.
Galvanized annealed	4.90c. to 5.15c.
Coppered basic	4.90c. to 5.15c.
Tinned soft Bessemer	5.90c. to 6.15c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	19¼c. to 20¼c.
High brass wire	20¼c. to 20¾c.
Brass rod	16¾c. to 17¾c.
Brass tube, brazed	26¼c. to 27¼c.
Brass tube, seamless	23 c. to 23½c.
Copper tube, seamless	25¾c. to 26 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22¾c. to 23¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20	
		Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		
		80 lb.	$6.05 $5.80
		90 lb.	6.15 5.90
		100 lb.	6.25 6.00
IC.	$10.00 $8.50	IC.	6.40 6.15
IX.	11.50 10.00	IX.	7.40 7.15
IXX.	13.00 11.25	IXX.	8.40 8.15
IXXX.	14.25 12.50	XXX.	9.40 9.15
IXXXX.	16.00 14.00	IXXXX.	10.40 10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	38c.
Bar	45c. to 50c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	8¾c.
Sheet zinc, No. 9 base, casks	9¾c. open 10¼c.

Lead and Solder*

American pig lead	7¾c. to 8½c.
Bar lead	9c. to 10c.
Solder, ½ and ½ guaranteed	26½c.
No. 1 solder	25c.
Refined solder	22¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c
Commercial grade, per lb	35c.
Grade D, per lb	25c.

Antimony

Asiatic	8¼c. to 9c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

There has been a tendency to shade prices a little this week. Business has been quiet. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	12.00
Copper, heavy wire	11.50
Copper, light and bottoms	9.50
Brass, heavy	6.50
Brass, light	5.50
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	8.00
Lead, heavy	5.00
Lead, tea	4.00
Zinc	3.75